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The impact of natural disasters on employee turnover: the shocks and after-shocks of hurricane Katrina on IT professionals

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THE IMPACT OF NATURAL DISASTERS ON EMPLOYEE TURNOVER: THE SHOCKS AND AFTER-SHOCKS OF HURRICANE KATRINA ON IT PROFESSIONALS

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DEDICATION

I gladly dedicate this dissertation to my family, especially…

to Sarah for her love, support, patience, and understanding
without which none of this would have been possible;

to Sarah Jane and Helen for amazing me every day and
making me a better man;

to Dad and Mom for instilling the importance of hard work and
a good education at a very early age;

to Barry – you challenged me just by being my brother.

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ABSTRACT

Hurricane Katrina was the most destructive natural disaster in American history and created the need for organizations along the Gulf Coast to employ disaster management and recovery plans. With the ubiquitous nature of computers and technology, IT professionals were critical organizational assets in executing those plans in order to insure the safety and recovery of valuable information. The purpose of this study is to gain a deeper understanding of the impact natural disasters have on IT professionals and their subsequent turnover decisions. The theoretical guide for this study was the Unfolding Model of Turnover (Lee and Mitchell 1994) that identifies 'shocks,' or jarring events, as a principal initiator of voluntary turnover. A mixed methods research strategy was employed consisting of a web-based survey of 153 IT professionals affected by Hurricane Katrina and 19 in-depth interviews. Over 58% of the surveyed participants who left their pre-Katrina employers followed one of Lee and Mitchell's theorized decision paths. The classification results increases to 84% with the inclusion of a new emergent decision path; providing evidence that the unfolding model is appropriate for studying disaster related turnover. Findings from this study indicate there are actions organizations can take to retain critical IT employees. Likewise, there are organizational actions, or 'aftershocks', that can initiate the cognitive decision process leading to turnover. This research constitutes an initial step toward understanding the factors that influence the turnover of IT professionals who have been affected by a natural disaster as well as providing practical suggestions for organizational disaster management planning.

CHAPTER 1: INTRODUCTION

IT professionals are a critical organizational resource and the retention of these valuable employees is an ongoing issue for organizations. While this is a difficult challenge under normal circumstances, the research study in this dissertation addresses the topic of turnover and retention of IT professionals when the stakes are even higher and retention is even more critical - when the organization experiences a natural disaster. During these times IT professionals are vital to a company's ability to maintain operations and to recover from the impacts of the disaster, and the loss of these employees can be extremely damaging.

Since 1950, the number and cost of natural disasters, worldwide and in North America, have increased significantly (Riebeek 2005). This might not seem particularly surprising, especially with a growing world population building more expensive infrastructure in areas that are prone to natural disasters, such as coastal areas (Changnon et al. 1997). The tendency for people to live in high-risk areas is only a partial reason for the increased cost. The United States' National Aeronautics and Space Agency released a report in 2005 confirming that natural disasters are increasing in frequency and severity (Riebeek 2005). The antecedents for this increase in number and size of natural disasters have sparked passionate scientific and political debates. While this debate is beyond the scope of this dissertation, the magnitude of the events and the increasing frequency are a likely reality that will continue to be a major issue for organizations. With natural disasters occurring more frequently, it is not unreasonable to predict that organizations will be more likely to experience an event that has the potential to disrupt

normal business activities than in the past. Also, given the increasing severity of natural disasters, the extent of the disruption is likely to be more severe.

When a natural disaster occurs, organizations affected by the devastation take actions to mitigate the disruption to the business and quickly return to normal operations (Junglas and Ives 2007). Consequentially, their employees are affected by both 1) the disaster and 2) their employer's actions. This study examines how natural disasters and an employer's actions or inactions influence the turnover decisions of their employees. More specifically, IT professionals affected by Hurricane Katrina were recruited to participate in a web-based survey developed from previous turnover theory to examine this question. Additionally, in-depth interviews were also conducted to further capture the experiences of the participants and their turnover decisions.

1.1 Motivation

With the increasing likelihood that an organization will experience the crisis of a natural disaster, there is also evidence that the potentially negative effects due to the loss of important systems and critical data can be mitigated by prior planning and implementing recovery procedures (Ives and Junglas 2006). Companies that have disaster management procedures in place recover 2.5 times faster after a disaster than companies that do not (Fink 1986). With the rise of information technology and the reliance on business-critical information, the importance of protecting irreplaceable data has become a priority in recent years. With computers and electronics penetrating nearly every facet of businesses, most companies describe their computer systems as critical in their operations (Turner 2007). As a result, companies are aware that they

need a disaster management plan focusing on digital information to limit data loss and to aid data recovery.

Effective information systems and access to appropriate data are vital to disaster management and recovery. Federal, state, and local agencies that collect, analyze, disseminate, or act on key information during a disaster require relevant data to provide a more effective and timely response. The private sector also plays an important role in a disaster recovery such as financial institutions that fund the recovery efforts. Moreover, a bank (or any other business) incapacitated with slow recovery would miss the opportunity to generate new business while losing market share to competitors (Pasek 2002). For example, Romano (1995) reported that a data center incapacitated by a natural disaster for only one week could cost the organization the equivalent of 3% or more of their annual gross sales - funds that may never be recovered.

Technology based disaster recovery plans provide the foundation for businesses to function after a disaster (Mathews 2005). While the plan may revolve around information technology (IT), it is not about IT; it is about the business. By identifying the IT systems that are critical to an organization and mitigating the risks of losing the critical IT personnel supporting those systems, management can develop a plan that expedites the resumption of normal operations (Hunton 2002).

1.2 Disaster Management and Organizations

A survey of CEOs conducted by *Time Magazine* (1986, p. 53) found that 89% believed that "a crisis is as certain as death and taxes." The events of Hurricane Katrina and similar

disasters have shown that no organization is immune from the possibility of experiencing a disaster. Haddow and Bullock (2004, p. 1) define disaster management as "the discipline of dealing with and avoiding risks by preparing for disaster before it happens, disaster response, as well as supporting, and rebuilding society after natural or human-made disasters have occurred." Alexander (2000, p. 20) describes a natural disaster as the consequence of a natural hazard that disrupts human activities. For completeness, Alexander (2000, p. 9) defined a natural hazard "as extreme events that originate in the biosphere, lithosphere, hydrosphere, or atmosphere" such as volcanic eruption, earthquake, landslide, or hurricane. For the purposes of this study, the focus will be natural disasters. This particular investigation will investigate the topic of employee turnover by IT professionals in the aftermath of the disaster wrought by Hurricane Katrina.

While no single, all-encompassing approach exists for a disaster management plan, a common practice in the disaster management literature is for organizations to focus on safeguarding the organization's information (Walch and Merante 2007). Hurricane Katrina was the costliest and most destructive natural disaster in the history of the United States (Knabb et al. 2006) and impacted the entire Gulf Coast region (see Figure 1-1). In the complex, fast-pasted business environment, a disaster management plan is only as good as the people and systems that support it. Previous reviews of organizations' disaster management plans reveal organizations' critical dependence on IT professionals during these times (Currion et al. 2007; Ives and Junglas 2006; Junglas and Ives 2007; Walch and Merante 2007). As a sales director interviewed in *ComputerWeekly* about his security and recovery plans stated, "[it] is not just about having the

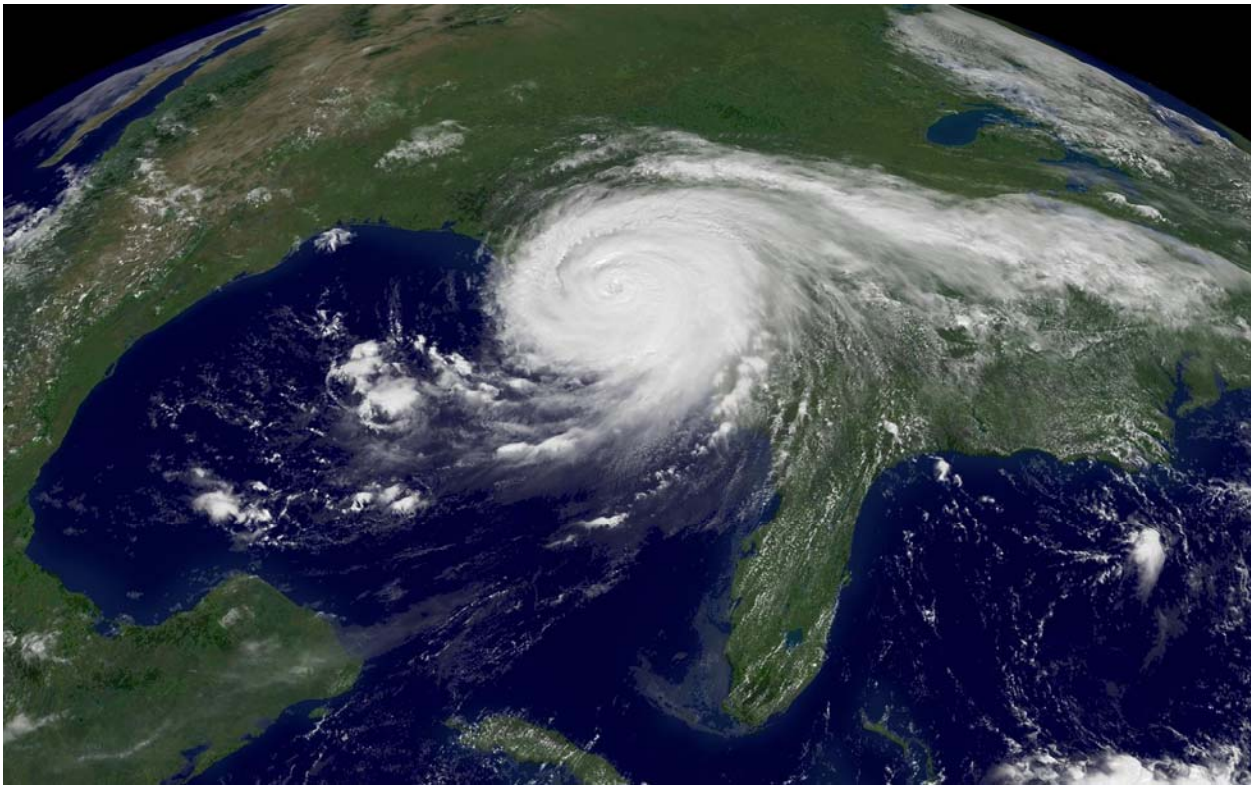

Figure 1-1: Satellite Photo of Hurricane Katrina dated Aug. 29, 2005 (NOAA 2005)

right tools and technologies — you need the **right** people in place to implement and operate them" (Warren 2004, p. 44). Immediately after a disaster, information needs increase, while at the same time putting IT professionals under increased stress and time pressure, thus greatly increasing the chances of burnout, low job satisfaction, role conflict, and other precursors leading to turnover (Milano 2005). It becomes vital for effective management of a crisis to recognize and mitigate factors that could lead to the turnover of their valuable IT professionals.

1.3 Turnover of IS/IT Professionals – Organizational Costs

Controlling IT turnover is a concern of management during normal cycles of the business. Even 10 years ago, studies found that turnover can be expensive with the replacement

of IT personnel costing companies $34K (Gerencher 1999). Agilent Technologies calculates a $250K cost incurred when a software engineer leaves (Joinson 2000). More recently, The U.S. Labor Department predicted that after going through the hiring process, training, additional supervision, wages and benefits, lost opportunities and extra work by others, turnover cost for skilled IT employees was up to 150% of their annual salary (De Paola and Vincenzo 2007). Additionally, the organizational specific knowledge and skills attained during the IT professional's tenure are lost, requiring a learning curve for a replacement employee (Herman 1997).

IT professionals also serve as corporate repositories of explicit and tacit knowledge regarding organizational systems, as well as keepers of these systems for other knowledge workers (Chen and Edgington 2005). They also maintain the knowledge about the details of an organization's particular systems and applications as well as the general programming languages and their constraints, and this can represent a significant value for the organization (Niederman et al. 2007). These factors all make IT employees' voluntary turnover particularly disruptive and costly during normal business cycles and would magnify the disruption during times of disaster recovery. Since the disaster plan is particularly sensitive to the need for preserving information system assets when disaster strikes, management's concern for controlling turnover of their IT staff would become magnified during a natural disaster or similar event. The cost for IT employee turnover during and post disaster could signify significant monetary losses, especially for service and information dependent organizations (Romano 1995).

1.4 Purpose of This Study

The intellectual roots for most of the current theory and research on voluntary turnover grew from March and Simon's (1958) ideas about the perceived ease and desirability of movement. With over 30 studies on IT turnover, however, Joseph et al. (2007) suggest that major gaps still exist in our understanding of the phenomenon in the domain of IT. The objective of this research study is twofold: first, to contribute to IT management practice by obtaining an increased understanding of IT turnover surrounding a natural disaster and, second, to examine the fit of the Unfolding Model of Turnover to IT professionals. The findings offer predictive or explanatory power to the disaster related turnover phenomenon in order to promote a deeper understanding for researchers and spark new management strategies and approaches.

Turnover is consequential and a goal is to help employers understand how their actions may influence turnover decisions and how to use this understanding to reduce employee turnover during and after a natural disaster or other crisis event. Despite goals of generalizability across all occupations, research indicates that the occupation or industry in question may affect the type of turnover decision process that is more or less likely to occur (Hom et al. 1992; Lee and Mitchell 1994). Using the same logic, this study further proposes that turnover may be further influenced by the external environment and situation; more specifically, the shocks associated with a natural disaster. It is important for researchers to study turnover processes across different situations, particularly when evidence exists that the frequency of natural disasters is increasing (Riebeek 2005) and organizational disaster management plans are highly dependent on IT professionals (Walch and Mertante 2007).

1.5 Research Questions

Fundamentally, this research seeks to understand not only why employees leave but how they reach the decision to leave their organizations when faced with the crisis of a natural disaster. This paper explores this topic with particular emphasis on the role of shocks in turnover. A shock is an initial, jarring event that prompts thoughts of quitting (Lee and Mitchell 1994). This idea is consistent with image theory, and particularly the mechanism of screening (Brown et al. 1987; Beach and Connolly 2005). With most alternatives automatically screened out, and since compliancy is the status quo of many people's careers, there is substantial merit in Lee and Mitchell's (1994) theory that a shock "shake[s] employees from their lethargy" (Morrell et al. 2004, p. 337).

The research questions below were formulated to guide this study on the turnover phenomenon amongst IT professionals affected by Hurricane Katrina. Lee and Mitchell's (1994) Unfolding Model of Turnover was a major influence on the study as a whole and the research questions in particular. The unfolding model will be presented along with a detailed explanation in Chapter 3.

RQ1: What factors influence turnover for IT professionals who experience a natural disaster?

a. Are there actions an employer can take to retain valuable IT professionals?

b. Are there employer actions that may drive away valuable IT professionals?

RQ2: What causes image violations for IT professionals experiencing a natural disaster?

a. Are the image violations based on the initial shock or aftershocks from the disaster? Or both?

RQ3: Which paths in the Unfolding Model of Turnover, either present in the model or emergent, best describe the turnover of IT professionals who experience natural disaster?

With a better understanding of the paths leading to turnover during times of crisis, management will be more able to anticipate and address potential situations to retain valuable employees. The bulk of previous studies using Lee and Mitchell's path model have targeted individuals that had experienced a wide range of shocks. This dissertation seeks to study a population of IT professionals that have recently experienced a common shock (Hurricane Katrina).

1.6 Organization of the Dissertation

The remaining chapters of this dissertation describe the literature review, methodology, and findings and are organized as follows:

Chapter 2 of this dissertation presents a review of the literature in the field of voluntary employee turnover.

Chapter 3 provides a description of Lee and Mitchell's (1994) Unfolding Model of Turnover.

Chapter 4 contains a description of the research methodology, discusses the selection of subjects, and data collection instruments. In addition, it describes the interviews that were conducted to better the role of natural disaster as a jarring event and subsequent turnover decisions.

In Chapter 5, the research findings are presented. Survey data is analyzed using the dichotomizing procedures of Lee et al. (1999) with classification portions compared against Lee et al. (1999) and Niederman et al. (2007). The qualitative interviews were analyzed to generate themes. General themes, descriptions, and interpretation of the themes are presented.

Chapter 6 reflects on the findings and includes a thorough discussion and integration of the findings from the quantitative and qualitative parts of the study.

Chapter 7 provides concluding remarks and suggests areas for further research along with the limitations of the study.

CHAPTER 2: LITERATURE REVIEW

This chapter provides a historical review of the relevant theory about the turnover phenomenon over the past 50 years. The literature is reviewed to identify previous theories on turnover. Additionally, the review establishes the scope and limitations of previous studies along with identifying an appropriate model for studying the turnover phenomenon in this research. First, several theories utilized in previous turnover research are discussed, followed by an overview the concept of turnover functionality. Next, the lack of research on disaster related employee turnover is discussed. Lastly, additional gaps in the literature are discussed.

2.1 Organizational Equilibrium Theory

The majority of studies on voluntary turnover in organizations can be linked to the research by March and Simon (1958). March and Simon propose that turnover is a consequence of perceived contributions to the organization surpassing perceived inducements from the organization. This inducement-contribution balance is generally influenced by the desirability to move and the perceived ease of movement (Joseph et al. 2007). Subsequent studies equated the desirability of movement to job satisfaction and the ease of movement with job alternatives (Jackofsky and Peters 1983). Theories about satisfaction and alternatives have "served as the basis for much of the literature on voluntary employee turnover" (Hulin et al. 1985).

The central concept in March and Simon's (1958) theory is that a simultaneous "pull" and "push" contribute to the employee's turnover. Externally, market forces exist, such as higher salary and better opportunities, that tend to pull, or coerce, an employee away from the

organization. Likewise, there are psychological forces internal to the employee, like job related perceptions and attitudes, that push them away from the organization (Josefek and Kauffman 2003).

2.2 Met Expectations Theory

Although equilibrium theory is considered seminal and provided the framework for successive models, few studies actually tested March and Simon's (1958) conceptual model and as a result years elapsed before additional theory emerged. Porter and Steers (1973) introduced a model in which "employees' met expectations were the driving factor in influencing turnover decisions" (Holtom et al. 2008, p. 237). Porter and Steers (1973) defined expectation as "the discrepancy between what a person encounters on the job in the way of positive and negative experiences and what he expected to encounter" (p. 154). Expectations can include salary, bonuses, advancements, and business environment (Joseph et al. 2007). More specifically, Porter and Steers argue that failure to meet employees' expectations can lead to dissatisfaction and ultimately turnover.

2.3 Linkage Model

Receiving substantial empirical support in the management literature (Mobley et al. 1978; Hom et al. 1992), Mobley (1977) introduced a model linking satisfaction to the decision to quit (Muchinski and Tuttle 1979). Mobley's (1977) model describes the concept of turnover as a process with the final act of quitting preceded by a sequence of steps. Mobley theorized that a set of "withdrawal cognitions (e.g., thoughts of quitting, expected utility of withdrawal) and job-

search behaviors (e.g., job search, evaluate alternatives) link[ed] job dissatisfaction to actual turnover behavior" (Holtom et al. 2008, p. 237).

Figure 2-1: Linkage Model of Turnover Adapted from Mobley (1977) (Hom and Griffeth 1995, p. 57)

Mobley's linkage model, shown in Figure 2-1, resulted in additional research attempting to refine and expand the model (Mobley et al.1979; Healy et al. 1995). Despite efforts to improve the model, the following research resulted in explaining less than 20 percent of the variance in turnover (Hom, Griffeth, and Sellaro 1984). Interestingly, Carsten and Spector

(1987) conducted a meta-analysis of 47 studies and found the corrected correlation between job satisfaction and turnover to be -0.26.

2.4 Disaster-Related Turnover

The turnover literature is virtually void of any studies on natural disasters and employee turnover, although a few exceptions do exist (Hermann 1963; Sanchez et al. 1995; Byron and Peterson 2002). In Hermann (1963), the author discusses organizational crises such as "large backlog of applications" at the US Patent Office resulting in a noticeable increase in the turnover of trained personnel. Sanchez et al. (1995) studied the effects of employer sponsored stress relief programs and the employee's perceived strain after Hurricane Andrew in Southern Florida. Distributing surveys at 30 and 90 days after Hurricane Andrew, the authors found that employer stress relief efforts helped employees with disaster related anxiety and employers providing stress relief programs experienced less absenteeism from their employees. Lastly, Byron and Peterson (2002) conducted a post-9/11 stress study on graduate students and found that the strain of traumatic events can lead to absenteeism.

2.5 State of the IT Turnover Literature

Joseph et al. (2007) conducted a meta-analysis on prior research examining the turnover of IT personnel. They found the IS field has accumulated a substantial "body of findings on turnover" with 33 studies conducted in the past 20 years. Of the 33 studies, they found that only two actually studied actual turnover behaviors with the others focusing on 'intent' or another surrogate construct. Furthermore, there were 43 distinct antecedents being utilized to capture

turnover intentions. The breadth of turnover predictors makes it difficult for researchers to build a body of knowledge and accumulate findings.

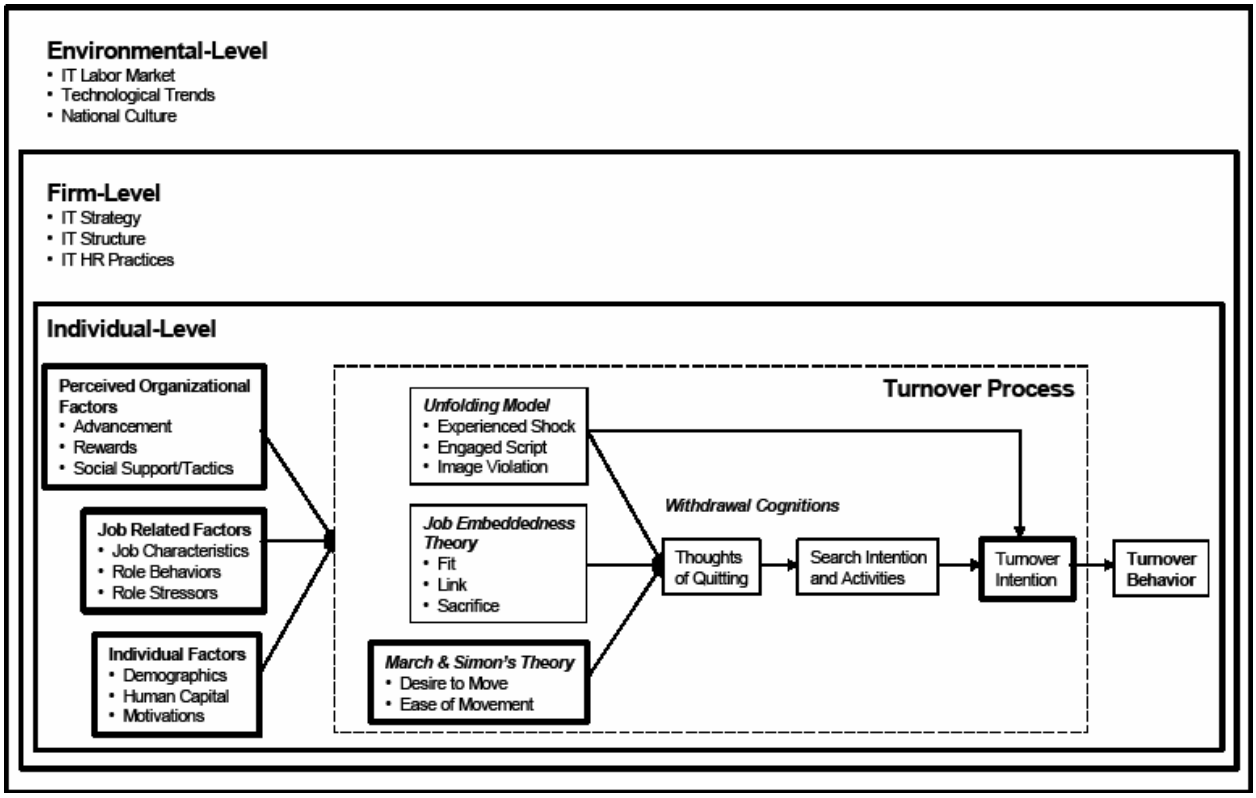

Figure 2-2: Contextual Model of Turnover (Joseph et al. 2007)

Another gap identified by Joseph et al. (2007) was the lack of attention to the context surrounding the turnover. Context is the surroundings that influence an individual's turnover decision such as the environmental and organization (see Figure 2-2). As a solution to their identified literature gaps, Joseph et al. (2007) suggest utilizing new theories to study the turnover phenomenon, such as Lee and Mitchell's (1994) Unfolding Model of Turnover.

2.6 Turnover Functionality

As a final note on the turnover literature, turnover functionality (or dysfunctional turnover) will be discussed. Previous research on employee turnover (Hollenbeck and Williams 1986; Williams 1999; Barrick and Zimmerman 2005) has found that all turnover is not the same. Hollenbeck and Williams (1986) suggest that turnover studies should distinguish between turnover frequency and turnover functionality because focusing on purely on the frequency of turnover can be misleading. Some turnover can benefit an organization, such as the case when low performers leave an organization thus increasing overall functionality (Williams 1999; Morrell et al. 2004). In contrast, dysfunctional turnover occurs when high performing employees leave an organization and overall functionality decreases (Hollenbeck and Williams 1986). Morrell et al. (2004) suggest implementing safeguards designed to identify and decrease turnover among high performers. Since organizations have grown increasingly dependent on computers and technology (Turner 2007), disaster related turnover of an organization's IT employees could hardly be considered any other than dysfunctional. Not particularly because of their high performance but because of their ability to safeguard, recover, and restore an organization's valuable information and systems.

CHAPTER 3: THE UNFOLDING MODEL OF TURNOVER

Recent developments in turnover theories, such as Lee and Mitchell's (1994) unfolding model, have begun to receive increasing attention in the turnover literature (Joseph et al. 2007; Niederman et al. 2007). Lee and Mitchell's (1994) Unfolding Model of Turnover adopts a more pragmatic approach to mapping turnover decisions by highlighting four different psychological paths that people take when quitting (see Figure 3-1). In particular, Lee and Mitchell (1994) propose that the process of turnover is often triggered by a shock, a jarring event that drives employees toward deliberate judgments about their jobs.

The process of employee turnover is modeled by four distinctive decision paths; each decision path represents a psychological process that incorporates the internal and external forces that influence turnover decisions. Lee and Mitchell (1994) seek to understand the factors that prompt employees to leave an organization voluntarily using internal and external perspectives. Previous research (Lee et al. 1999; Joseph et al. 2007) has suggested this concurrent examination of push- and pull- focused theory seems likely to produce considerable insights into the understanding of voluntary employee turnover.

Lee et al. (1999) found that although individuals experience unique circumstances when they leave organizations, they appear to follow one of four psychological and behavior paths when quitting. First, the turnover is usually initiated by a shock or jarring event that is the catalyst for the psychological analyses involved in quitting a job. Second, a script is a preexisting plan of action, and it can be based on past experiences, observation of others,

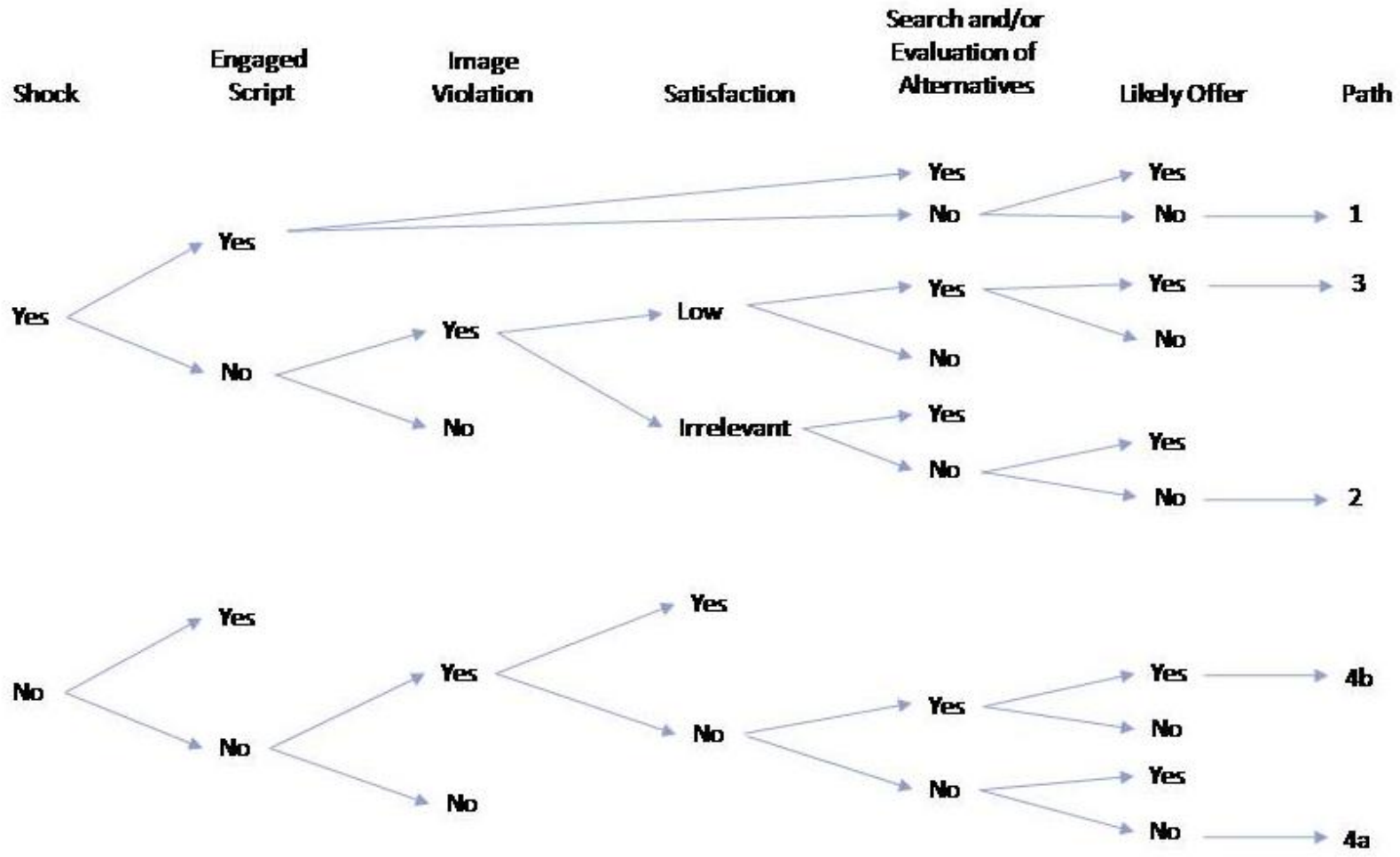

Figure 3-1: Lee et al.'s (1999) Unfolding Model of Turnover

reading, or social expectations. Third, image violations occur when an individual's values, goals, and strategies for goal attainment do not fit with those of the employing organization or those implied by the shock. Fourth, lower levels of job satisfaction occur when people come to feel over time that their jobs no longer provide the intellectual, emotional, or financial benefits they desire. Fifth, search applies to the activities involved with looking for alternatives to a current job and the evaluation of those alternatives. Next is the reception of an offer and the last is the manifestation of the turnover intention with actually quitting.

3.1 Selection of the Unfolding Model

As stated earlier, the purpose of this study is to obtain an increased understanding of IT turnover surrounding a natural disaster and to examine the fit of the Unfolding Model of Turnover to IT professionals. Lee and Mitchell's (1994) Unfolding Model of Turnover encompasses the concept of a shock or 'jarring event' that is the catalyst for turnover decisions. Natural disasters are a variety of shocks that can, and often will, affect the technology sector at the individual, firm, and community level simultaneously (Chopra and Sodhi 2004). From a community or environmental view, natural disasters have an immediate influence on the labor market. The demand for certain skills and abilities can increase (or decrease) in a very short amount of time. This would be especially true with shifting technological trends due to damaged infrastructures (Junglas and Ives 2007). Individuals can experience additional role stressors, change in values, and will require alternative motivators (Joseph et al. 2007). Caught in the middle, organizations must react to the changes at the environmental and individual levels with new strategies, IT structures, and human resource practices.

This study utilizes Lee and Mitchell's (1994) Unfolding Model of Turnover to analyze the individual-level experiences of IT professionals affected by Hurricane Katrina. The unfolding model is uniquely adept for studying the individual nuances of the turnover decision since it provides multiple decision paths leading to the final act of quitting (Joseph et al. 2007). Lee and Mitchell's (1994) turnover paths are logically grounded and further explain the contextual experiences of IT professionals leaving (and staying with) their organizations after a natural disaster.

3.2 Shocks

In the Unfolding Model of Turnover (Lee and Mitchell 1994), three of the decision paths are preceded by some type of shock. The shock can be (1) expected or unexpected, (2) positive or negative, and (3) personal or organizational. Some examples of shocks from previous studies include: leaving an organization because of a spouse's transfer, becoming a stay-at-home parent after giving birth, and leaving an organization to attend graduate school (Lee and Mitchell 1994; Lee et al. 1999; Niederman and Sumner 2004; Niederman et al. 2007). After the shock, several theoretical paths were developed based on the employees' prior experience dealing with a similar shock, actions by the organization, and employment alternatives.

Contrary to other studies (Mobley 1977; Healy et al. 1995), Lee and Mitchell (1994) proposed that accumulated job dissatisfaction is not an immediate cause of most voluntary turnover. While job satisfaction is a factor, the unfolding model does not focus on it as the prevailing factor of turnover the turnover decision (Holtom et al. 2005). Lee et al. (1999) found that in order to understand turnover it is critical to understand the precipitating events that cause

voluntary departure since the preceding shock is a better predictor of turnover more often than accumulated job dissatisfaction.

Lee and Mitchell's (1994) consideration of shocks as the initiating event toward turnover "advance[s], rather than replace[s], existing theory and empirical knowledge of employee turnover" (Holtom et al. 2005, p. 341). A shock to the system is theorized to be a jarring event that causes employees to pause and deliberate about their jobs and, perhaps, to quit, "It shakes an employee out of a steady state or challenges the status quo with respect to his or her thinking about the job" (Lee and Mitchell 1994, p. 61). As a powerful driver of turnover, understanding shocks and how it affects an employee's turnover decision process enables organizations to better manage turnover (Niederman et al. 2007).

3.3 Script

A script is a preexisting plan of action most likely, although not entirely, due to previous experiences. The script is simply a plan based upon previous experiences, observations of similar situations, or preconceived beliefs (Lee and Mitchell 1994). The script could be in response to a pregnancy, moving to follow a spouse, or any other predetermined view about reacting to an event. The script-driven process is almost mechanical in nature because "leaving is fairly automatic" (Lee and Mitchell 1994, p. 64). Script-driven decisions are less likely to involve interpreting images, evaluating job alternatives, or thresholds of job dissatisfaction. Employees would make the turnover decision much quicker and with fewer deliberations because the shock results in scripted behavior, where a non-scripted turnover decision might require multiple deliberations (Lee and Mitchell 1994).

3.4 Image Violation

Meanwhile, for those employees not implementing a preexisting script "the shock is deciphered and integrated into the employee's system of values, beliefs, and images" (Lee and Mitchell 1994, p. 60). From Beach's (1990, p. 272) generic decision-making model, image theory asserts that "choice occurs relatively rarely" and "behavior largely is preprogrammed." People are constantly saturated with information, (e.g., advertising, suggestions) with most of these "suggestions" simply ignored and the status quo continues. Thus, much of the information suggesting change is filtered and rejected (Lee and Mitchell 1994).

Image violations can arise from "information or events can cause conflict between life domains" (Lee and Mitchell 1994, p. 59). A job transfer may be good for a person's career while simultaneously creating conflict at home. Brown et al. (1987) found that ambiguous images can hinder the screening process and cause a more deliberate decision-making process. In relation to turnover, image violations occur when an individual's values, goals, and strategies for goal attainment do not fit with those of the organization or those reflected in the shock. Morrell et al. (2004) argue that image theory offers a sounder basis for representing turnover as a decision enacted by the leaver.

3.5 Job Satisfaction

Unlike previous turnover theories, "the unfolding model posits a varying role for satisfaction across paths" (Lee et al. 1999, p. 455). In some cases, such as an employee quitting because of the birth of a child, job satisfaction may not even be a consideration or an otherwise

"satisfied" employees leaves to take a higher paying job. Instead, the resolution to quit is based on a preconceived plan making job satisfaction almost irrelevant. This is not to say that job satisfaction is not important. Lee and Mitchell (1994) acknowledged three turnover paths where job satisfaction is a contributing factor and in two of the paths it is the construct theorized to initiate the turnover path. Interestingly, Lee et al. (1999) found more people reported leaving because of a shocking event than because of lower levels of satisfaction.

3.6 Search and/or Evaluation of Job Alternatives

For job alternatives, Lee et al. (1999) suggest that a job offer need not be in hand for it to affect the cognitive deliberations involved with quitting; instead, an alternative to a current job need only to be perceived as highly likely to prompt subsequent action. Job alternative is not limited to becoming an employee with another organization. They point out that the meaning includes alternate forms of work and non-work options such as graduate school, starting a business, etc.

3.7 Paths to Turnover

The unfolding model depicts the turnover process as decision paths. According to Lee and Mitchell (1994, p. 60) a decision path "summarizes how employees interpret their work environments and how they identify decision options and enact responses." Principal to the model is the different foci across the turnover paths. Path 1 is described by Lee and Mitchell (1994, p. 69) as "fairly automatic, simple, and script-driven process; it involves minimal mental deliberations." In path 1, the employee encounters a shock, engages a preexisting script, and quits with no (or minimal) search for alternatives. With path 2, there is no pre-existing script but

the image violation is causes the employee to quit without searching for any alternatives. Paths 3 and 4b are very similar (low job satisfaction, searching for alternatives) with the only difference being the perception of a shock. Both paths involve a more deliberate decision process and the employee does not leave until another position is either offered or likely to be offered. In path 4b, accumulated job dissatisfaction is the initiating event and causes the employee to leave with little or no search for alternatives. See Table 3-1 for a list of the decision paths.

Table 3-1: Lee and Mitchell's (1994) Decision Path to Turnover

	Path				
Attribute	**1**	**2**	**3**	**4a**	**4b**
Initiating Event	Shock	Shock	Shock	Job Dissatisfaction	Job Dissatisfaction
Script / Plan	Yes	No	No	No	No
Image Violation	Irrelevant	Yes	Yes	Yes	Yes
Relative Job Dissatisfaction	Irrelevant	Irrelevant	Yes	Yes	Yes
Alternative Search	No	No	Yes	No	Yes
Offer or Likely Offer	No	No	Yes	No	Yes
Time	Very short	Short	Long	Medium	Long

3.8 Aftershocks

The suggestion of an aftershock is an original consideration for the Unfolding Model of Turnover (Lee and Mitchell 1994). Similar to the main shock, an aftershock is a jarring event

that occurs after the initial shock and it is most likely associated with the employer's reaction to the main shock. Perhaps the term 'aftershock' is better understood in terms of earthquakes. An aftershock is an earthquake that occurs after the main earthquake and usually tends to be of smaller magnitude (McGuire et al. 2005). These aftershocks are particularly dangerous because they are usually unpredictable, can be of a large magnitude, and can collapse structures that were damaged from the main shock. Organizational reactions mediate the impact of the initial shock and serve to magnify or diminish an employee's perceived jar from the shock.

Drawing from role stress theory, it can be argued that role conflicts are created when an organization takes steps to magnify an existing shock (Moore 2000). A classic example would be a work-family conflict. Consider the proposal of an aftershock where the birth was the main shock but the employer's reaction to the birth, in regards to telecommuting, flexible work hours, etc., magnifies the impact on the employee. In this scenario, the shock of having a child was not sufficient to trigger the turnover decision process but the employer's rigid reaction served to magnify the issue causing an image violation due to the aftershock.

Conversely, an employer's reaction could serve to absorb some of the tremors of a shock. An employer's reaction that demonstrates compassion is posited as negatively related to turnover intention via enhanced job satisfaction because of enhanced intrinsic motivation (Jackson and Schuler 1985). Suppose the shock a having a child has caused an employee to contemplate leaving. The employer can take steps to lessen the shock by allowing the employee to telecommute, work alternate hours, providing daycare services, etc.

3.9 Current State of the Model

Lee and Mitchell's (1994) Unfolding Model of Turnover has generated strong interest amongst researchers interested in studying voluntary turnover. The authors have published two additional tests of their model (Lee et al. 1996; 1999). In Lee et al. (1996), the authors utilized the model to explain turnover amongst 44 nurses and found 62.5% of the participants followed their proposed decision paths. Capitalizing on the lessons learn from the nursing turnover study, the survey measures utilized in Lee et al. (1999) further distinguished between the existence of a script and the engagement of a existing script. Lee et al. (1999) addressed the ambiguities surrounding job alternatives, job search, and likely offers that surfaced in Lee et al. (1996). Lee et al. (1999) also attempted to extend the theory by hypothesizing on the speed (or duration) of the decision paths but found little supporting evidence. Additionally, Lee et al. (1999) developed and implemented the study as a survey allowing for a higher participation rate compared to the semi-structured interviews utilized in Lee et al. (1996). By incorporating the measurement improvements to their model, Lee et al. (1999) were able to classify 92.6% of the sample's turnover into their model.

With Lee and Mitchell's (1994) broad definition of what constitutes a shock, Morrell et al. (2004) sought to better understand the type of shock and resulting effects on turnover. They found that the shocks most likely to cause turnover were unexpected, negative and non-work related. While the previous mentioned studies had focused on a singular type of employee (accountants or nurses), Holtom et al. (2005) tested the unfolding model across six independent

samples composing 1200 ‘leavers’ (e.g., nurses, accountants, bank employees, prison guards, and registrants for the Graduate Management Admission Test (GMAT)) and found the model explained 64% of the voluntary turnover.

Donnelly and Quirin (2006) tested the model with both ‘leavers’ and ‘stayers.’ In this study, the Unfolding Model of Turnover (Lee and Mitchell 1994) was able to classify 91% of the leavers and 79% of the stayers. Further inquiry as to what separated a stayer from becoming a quitter indicated that 83% of the stayers stated their decision to stay was based on economic considerations. Interestingly, Donnelly and Quirin (2006) also found that women were more likely to experience a shock that leads to turnover. The authors speculated the difference was attributable to pregnancy and childbirth.

Niederman et al. (2007) provide the first application of the unfolding model to IT professionals. In this study, the authors surveyed 124 MIS alumni from two universities in the Midwest. Niederman et al. (2007) discovered a drastically lower classification rate with only 12% of the respondents following one of Lee and Mitchell’s (1994) theorized paths. Niederman et al. (2007) further suggested three emergent paths (see Figure 3-2) beyond the five turnover decision paths from the Unfolding Model of Turnover (Lee and Mitchell 1994).

In their study, Niederman et al. (2007) found a significant majority of MIS graduates (68%) followed three new paths not previously theorized. Paths 1a and 1b are essentially the same except path 1a is caused by a negative shock and path 1b is caused by a positive shock. Path 4c is identical to path 1a with the exception of being initiated by a shock. During their

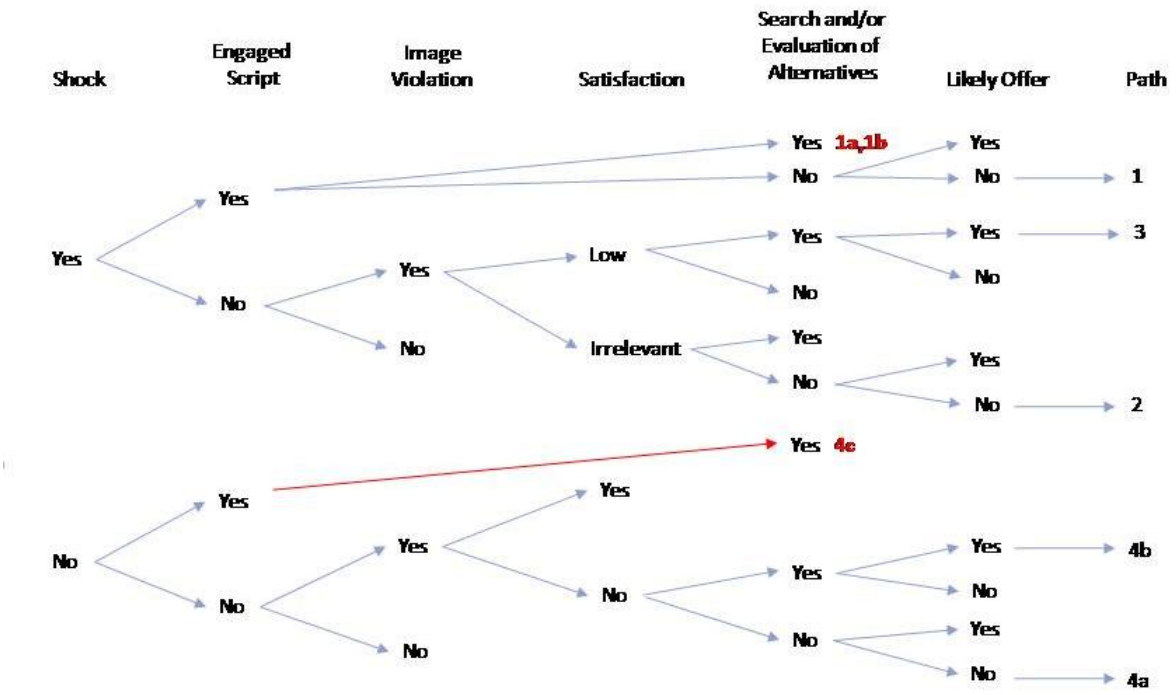

Figure 3-2: Niederman et al.'s (2007) Extended Model of Turnover

classification analysis, Niederman et al. (2007) also identified paths 1c, 1d, 3a, 3b, 4d, 4e, 4f, 4g, 4h, 4i, 4j, and 4k which identified the decision path of some leavers but the paths were not statistically significant.

3.10 Expectations

The expected findings from utilizing Lee and Mitchell's (1994) Unfolding Model of Turnover are based on literature reviews from (1) previous studies on IT professionals and (2) previous applications of the unfolding model. Prior research found IT professionals may act differently from other employees (Cougar and Zawacki 1979; Cougar and Adelsberger 1988; Cougar 1988; Kerr et al 1977; Myers 1992). Although the assumption that IT professionals are

somehow different from other professionals (such as nurses, accountants, etc.) has mostly been abandoned in current IS research, Niederman et al. (2007) reported the majority of their sample of IT professionals experienced unique decision paths not identified by the Unfolding Model of Turnover (Lee and Mitchell 1994).

Contrary to Niederman et al (2007), most of the other previous studies (Lee et al. 1996, 1991; Morrell et al. 2004; Holtom et al. 2005; Joseph et al 2007) utilizing the unfolding model reported support for the five decision paths identified by Lee and Mitchell (1994). While the theory is beyond emergent, the unfolding model is relatively immature compared to other turnover theories and has yet to be considered mainstream (Joseph et al. 2007). As such, successive studies continue to build on the unfolding model's theoretical foundation and improve latent measures of the model's foci.

Niederman et al.'s (2007) findings provide inadequate support for the assumption that the turnover of IT professionals entails unique decision paths. Perhaps the uniqueness of the IT workforce remains an unanswered question but another explanation for Niederman et al.'s (2007) uncharacteristic findings involve a possible confusion between the existence versus engagement of a preexisting turnover script. A significant majority of their sample (68%) followed 3 new, nontheorized paths that are based on the engagement of a preexisting turnover script. While this is only speculation, it would explain the atypical findings since even the originators of the model (Lee and Mitchell 1994; Lee et al. 1996, 1999) experienced similar existence/engagement perplexity as their theory emerged in conjunction with the development of measures. Consequently, findings from this study were expected to follow the paths initially identified by Lee and Mitchell (1994) while providing little support to Niederman et al.'s (2007) claim that IT professionals follow uncommon decision paths.

3.11 Summary

Apart from the findings of Niederman et al. (2007), employees appear to follow one of four psychological and behavioral paths when quitting. Previous studies by Lee and Mitchell (1996; 1999) were able to use the four paths to describe over 90% of the employees' decision paths when voluntarily leaving an organization. For three of the paths, a shock was the event that signaled the initiation of the leaving process. As such, shocks represent an important new tool for understanding and managing turnover.

The Unfolding Model of Turnover (Lee and Mitchell 1994) is particularly applicable for this study because of concept of a shock or jarring event initiating the turnover decision. The participants in this study experienced a common shock with Hurricane Katrina and this will be the first implementation of the model focusing on a mutual shock. Additionally, as described in the following chapters, this study provides conflicting results to the Niederman et al. (2007) findings that the model is not appropriate for studying IT turnover. Additionally, this study provides support for utilizing the model to study natural disaster-related turnover. Contributing to the model, this study suggests improvements to the measures such as the incorporation of Rousseau's (1989) psychological contract theory along with evidence of an emergent path.

CHAPTER 4: RESEARCH METHODOLOGY AND DATA COLLECTION

This dissertation employs both quantitative and qualitative techniques to study the factors influencing turnover of IT professionals who have experienced a natural disaster. The mixed methods approach was accomplished using a concurrent nested research strategy where the predominant method guiding the study was qualitative. The quantitative method is nested within the qualitative method and addresses a different research question at a different level. Data from both methods is mixed during collection and analysis. This chapter will provide the rationale for conducting mixed method research and then provides an overview of the concurrent nested strategy employed for this study.

4.1 Research Methodology

A research methodology describes the activity of the research, the process, how to measure progress, and what constitutes success. Mingers (2001, p. 242) defined a research methodology as a "set of structured guidelines or activities to assist in generating valid and reliable research results." As McGrath (1982) noted, it is not possible to do an unflawed study and any research method chosen will be imperfect, limiting the conclusions that can be drawn. The constraints of using a single research method, however, can be addressed by utilizing a combination of methods to compensate for limitations while complementing and expanding conclusions and findings.

An underlying assumption in quantitative research is that research designs should be based on a postpositivist approach. Postpositivist refers to the thinking following positivism and

reflects a determinist philosophy in which causes determine effects or outcomes (Phillips and Burbules 2000). In the postpositivist paradigm, knowledge is developed by employing strategies of inquiry such as experiments and surveys, and data is collected on predetermined instruments that yield statistical data (Creswell 2002). Quantitative research relies on the belief that one can seek to explain and predict what happens in the social world by searching for patterns and relationships (Creswell 2002). Traditionally, postpositivist assumptions have governed claims about what warrants knowledge.

In contrast, qualitative research methods are distinguished through the use of qualitative data, such as interviews, documents, and observation data, to understand and explain social phenomena (Denzin and Lincoln 2000). Qualitative researchers seek to study a phenomenon in its natural setting. The qualitative researcher makes an interpretation of the data to include developing descriptions of an individual(s) and settings, analyzing data for trends or themes, and finally drawing conclusions about meanings and discussing lessons learned (Creswell 2002).

In general, social scientists make a distinction between quantitative and qualitative research (Creswell 2002, p. 13) although arguments for utilizing mixed procedures are increasing (Tashakkori and Teddlie 2003). In his investigation on the history of science, Kuhn (1961, p. 162) concluded "large amounts of qualitative work have usually been prerequisite to fruitful quantification in the physical sciences." Additionally, there are an increasing number of IS studies that promote the utility of combining multiple research methods (Gable 1994; Kaplan and Duchon 1988; Lee 1991; Mingers 2001). Creswell (2002, p. 22) states that "A mixed method design is useful to capture the best of both quantitative and qualitative approaches." An

empirical example of the use of mixed method research is the study by Markus (1994) on electronic mail. Because of the conflicting theoretical requirements of media richness and social definition theories, Markus undertook a mixed methods approach of administering surveys, analyzing archival messages, and conducting interviews.

Green and Caracelli (1997) highlight five major purposes for conducting mixed-method research. A brief explanation of their motivation along with rationale how a mixed methods approach can enhance this study follows:

1. Triangulation. From its classic sources, triangulation refers to the designed use of multiple methods, with offsetting or counteracting biases, in investigations of the same phenomenon in order to strengthen the validity of inquiry results. In this study, triangulation will increase chances to control, or at least assess, some of the threats or multiple causes influencing the results.

2. Complementarity. The elaboration from the use of multiple methods increases the interpretability, meaningfulness, and validity of constructs by capitalizing on inherent strengths. Rather than simply capturing an employee's turnover path, combining methods provides a deeper understanding of the cognitive process involved in leaving (or staying) after experiencing a shock.

3. Development. The result from one method is used to inform and shape subsequent methods or steps in the research process. In this study, responses to the survey were used to deliberately select interview participants. Additionally, the interviews were conducted in three phases such that the data can be transcribed and analyzed to better inform subsequent interviews.

4. Initiation. Mixed method research stimulates new research questions or challenges results obtained through one method. In-depth interviews were used to provide new insights on how, or if, the Unfolding Model of Turnover predicts the actions of IT professionals experiencing a natural disaster.

5. Expansion. Mixed method research brings richness and detail to a study exploring specific features of each method. In our case, integration of procedures mentioned above will expand the breadth of the study and enlighten the more general debate on turnover and disaster management in organizations and the role of the IT professionals in the disaster recovery process.

In sum, a research strategy integrating different methods was chosen as the research strategy in order to produce better results in terms of quality and scope. Mixed method research is a creative alternative to traditional approaches for advancing our understanding of otherwise elusive social phenomena.

4.2 Research Strategy

In conveying a specific strategy for conducting a mixed method study, researchers must plan the sequence of data collection and analysis. Previous authors (Morgan 1998; Greene and Caracelli 1997; Creswell 2002) have identified criteria for choosing a mixed methods data collection strategy that involves implementation, priority, and integration. For this study, a concurrent nested strategy was utilized and the above mentioned criteria are discussed in the following sections.

4.2.1 Concurrent Nested Strategy

In a concurrent strategy, qualitative and quantitative data are collected simultaneously (see Figure 4-1). Unique to a concurrent nested strategy, the approach has a "predominant method that guides the project" (Creswell 2002, p. 218). This mixed methods model has many advantages. Foremost, the concurrent nested strategy can benefit from a broader perspective as a result of viewing a phenomenon via qualitative and quantitative methods in parallel. Morse (1991) suggested that qualitative studies would be enriched when including quantitative methods to capture information from the participants. Additionally, she noted that qualitative data could be used to obtain and illustrate an aspect of a phenomenon that cannot be quantified.

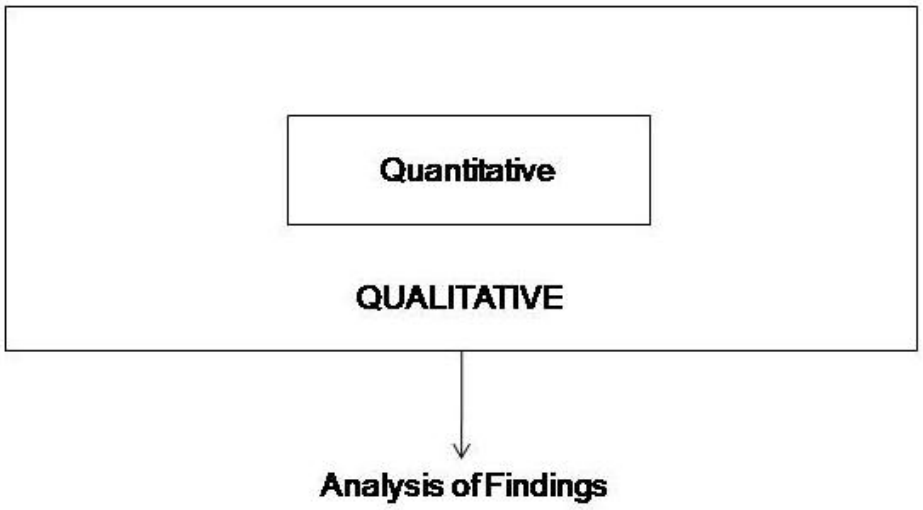

Figure 4-1: Concurrent Nested Strategy (Creswell 2002, p. 214)

In this study, the predominant data is qualitative while the quantitative portion is embedded, or nested, in the qualitative portion. This strategy is used to gain a broader perspective as a result of utilizing different methods as opposed to using the predominant method alone. As the predominant and guiding method, the orientation of the qualitative portion of this study is to address all the research questions and provide a deeper understanding of disaster related turnover. By nesting, the embedded method, quantitative, is used to address the third research question, "Which paths, present in the model or emergent, best describe the turnover of IT professionals who experience natural disaster?" at a different level than the qualitative interviews. Additionally, the survey serves as the primary recruiting and screening instrument for participant inclusion in the qualitative portion.

4.3 Participants

The population of interest for this study included all information technology professionals who were affected by Hurricane Katrina. More specifically, IT professionals

employed on the Gulf Coast areas of Texas, Louisiana, Mississippi, and Alabama on August 29th, 2005 inclusive of any individuals who perceived a shock due to Hurricane Katrina. The study targeted these IT professionals because of three main reasons:

1. Business disaster plans are highly IT dependent and usually require actions by IT professionals to prepare, safeguard, handle, and recover sensitive data necessary for a business to conduct operations (Junglas and Ives 2007).
2. Loss of these critical employees during a natural disaster could delay recovery efforts and magnify the damage caused by a crisis. As an example, within a week after Hurricane Katrina hitting, Hancock Bank had already arranged $2.7 million worth of new loans but needed access to their off-site data before final approval (Grow 2005).
3. Many organizations view Hurricane Katrina as a "wake-up call" to better disaster management planning (Ives and Junglas 2006) and identifying disaster related turnover trends will better prepare organizations for future events.

The study sample was restricted to the Gulf Coast states because of the following:

1. Variation among areas in the periphery of the storm path provide a contrast with the areas experiencing higher amounts of devastation.
2. Limiting the sample to the Gulf Coast increased the probability of recruiting participants that were affected by Hurricane Katrina.
3. There was value in studying a population that experienced a common shock. To the best of our knowledge, this will be the first turnover study with participants that experienced the same shock. Lee and Mitchell's (1994) definition of a shock is relatively broad with

studies utilizing the model relying heavily on the participants' perception in identifying an event that initiated the turnover decision process.

4. The study addresses a particularly salient issue for organizations along the Gulf Coast. According to the National Weather Center, Hurricane Katrina was the third-strongest hurricane on record to make landfall and the costliest hurricane in the history of the United States. The results can provide useful information to enhance disaster management planning and recovery.

4.4 Qualitative Methodology

The purpose of the qualitative data collection and analysis was to seek a deeper understanding of Lee and Mitchell's (1994) Unfolding Model of Turnover in regards to IT professionals who had been affected by Hurricane Katrina.

4.4.1 Multi-phased Interviews

In-depth, semi-structured interviews were conducted with 19 participants purposefully selected to represent a contrasting range of those who left their pre-Katrina employers ('leavers') and those who continued employment with their pre-Katrina employers ('stayers'). Interviews are a key venue for conducting qualitative research (Kvale 2007). The qualitative interview provides a means for exploring the participants' lived experiences using their own words and stories. The interview is a powerful technique for capturing knowledge from human situations.

Qualitative interviews are inherently open and void of strict rules that might otherwise impede other forms of investigation. The freedom of exploration offered by interviews does not

mean researchers should not prepare for conducting interviews. Kvale (2007, p. 35) describes 7 standards for choosing the methods for conducting the investigation:

1. Thematizing. Formulate the purpose of an investigation and the conception of the theme to be investigated before the interviews start. The purpose for conducting interviews in this study is to answer the research questions and ultimately gain a better understanding of disaster related turnover.
2. Designing. Plan the design of the study, taking into consideration all stages of the investigation. As stated earlier, the survey portion is the primary means of recruiting and screening participants for the interviews. Additionally, the interviews were conducted in three phases with findings from previous phases utilized to inform subsequent interviews.
3. Interviewing. Conduct the interviews based on an interview guide with a reflective approach to the knowledge sought and the interpersonal relationship of the interview situation. Semi-structured interviews were conducted allowing the conversation to develop around each participant's unique experiences.
4. Transcribing. Prepare the interview material for analysis. All of the interviews were transcribed with preliminary analysis conducted at the conclusion of each data collection phase.
5. Analyzing. Decide which modes of analysis are appropriate for the interviews. For this study, the transcribed interviews were coded and analyzed (see section 4.2.2).

6. Verifying. Ascertain the validity, reliability and generalizability of the interview findings. (Discussed in subsequent chapters.)
7. Reporting. Communicate the findings of the study and the methods applied in a form that lives up to scientific criteria. (Discussed in subsequent chapters.)

The purpose of this part of the study was to gain an in-depth understanding of the IT professionals' experiences with Hurricane Katrina. More specifically, the interviews were structured to answer the research questions. For this study, semi-structured and generally open-ended questions were developed based on the constructs and paths in the Unfolding Model of Turnover (Lee and Mitchell 1994) and analysis from previous phases (see Appendix B for the Interview Guide). During the interviews, the conversation was varied based on the specific characteristics and experiences of each participant and the opportunity to explore certain topics in greater depth.

The interviews were conducted in three phases. The first phase consisted of 6 interviews and was conducted as a preliminary stage that allowed for analysis and preliminary findings to inform subsequent interviews. Participants in the preliminary phase were deliberately selected to represent not only leavers and stayers but also the different geographical areas affected by Hurricane Katrina. The intention was for a broad selection in the preliminary phase to guide future participant solicitation and interview structure. The second interview phase consisted of 9 qualitative interviews conducted to follow-up on emerging patterns and insights and incorporates the earlier findings from the preliminary phase. The final phase consisted of 4 qualitative

interviews continuing the incorporation of findings from the previous phases with an emphasis on areas in the periphery of Hurricane Katrina's path of destruction.

If convenient for the participant, interviews were conducted face-to-face, otherwise telephone interviews were conducted. All but two of the interviewed participants found it more convenient to conduct the interviews via the telephone. Additionally, two other participants, initially interviewed by phone, responded to emailed follow-up questions and the relevant text from the email responses was added as an addendum to the transcribed interview. See Table 4-1 for interviewee demographics.

Table 4-1: Interviewee Demographics

	Participant Number	Location	Interview Type	Unfolding Model Path
Phase 1	78	Jackson, MS	Phone / Email	n/a
	180	Long Beach, MS	Phone	3
	233	Baton Rouge, LA	Phone	3
	246	Pascagoula, MS	Phone	n/a
	264	Biloxi, MS	Phone	3b
	269	Gulfport, MS	Phone	3
Phase II	43	Baton Rouge, LA	Face-to-Face	n/a
	110	New Orleans, LA	Phone	n/a
	181	New Orleans, LA	Phone	n/a
	220	Galveston, TX	Face-to-Face	3
	253	Denver, CO	Phone	3
	258	Biloxi, MS	Phone / Email	n/a
	322	New Orleans, LA	Phone	n/a
	405	New Orleans, LA	Phone	3c
	418	Metairie, LA	Phone	n/a
Phase III	178	Houston, TX	Phone	4b
	212	Baton Rouge, LA	Phone	n/a
	279	Bay St. Louis, MS	Phone	n/a
	393	Baton Rouge, LA	Phone	3b
Note: Participants who have left their pre-Katrina employer are highlighted				

After completing the Informed Consent process and requesting their permission to tape the interview, the interviews were recorded and captured as MP3 files using Freecorder 2.0 by Applian Technologies. The MP3 files were then imported into Transcriber 1.5.1 where the conversations were transcribed into ASCII text files. During the transcription process, names of individuals and employers were removed to preserve anonymity.

Interviewees were selected from a pool of participants that had already responded to the online survey so the interviewer was equipped with knowledge about the participants' employment surrounding Hurricane Katrina along with other information that allowed him to organize and prepare for the interviews. For each phase, interviews were scheduled with selected participants and usually took one week to conduct all the interviews for the phase. Notes were taken immediately after each of the interviews as a means to obtain a general sense of the interview and start the preparation for the next interview.

4.4.2 Analysis

After the interviews were transcribed, the researcher read through all the data observing for preliminary themes. Using the constructs identified in Lee et al. (1999), emergent themes, and codes from any previous phases the transcribed interviews were coded using Atlas Ti 4.2. An example of the coding is shown in Figure 4-2.

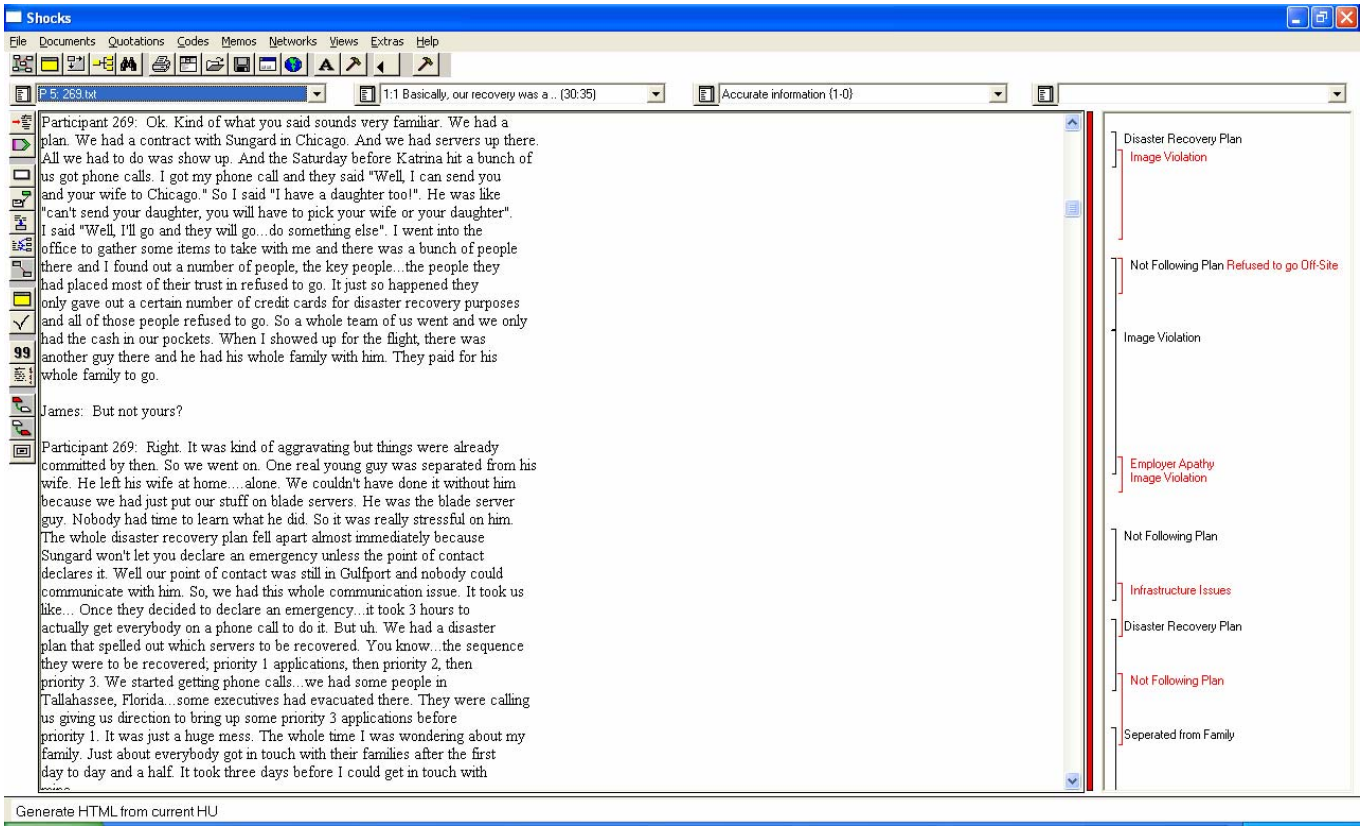

Figure 4-2: Coding with Atlas

Topics were developed by clustering related codes into major themes, unique topics, and miscellaneous 'leftovers.' See Table 4-2 for an example of clustered codes and Appendix C for a complete list. Similar topics were then grouped into categories and final themes were generated based on the interrelationships between the categories. General descriptions were generated for each of the themes. Finally, an interpretation of the data resulted in "lessons learned." Results of the analysis are described in the following chapter.

Table 4-2: Example of Clustered Codes

Employer Actions - Good	Employer Actions - Bad
Allowed to Telecommute	Employer Apathy
Alternative Work Hours	Image Violation
Compensation	Impersonal Response from Organization
Convey Longevity	Lack of Recognition
Employer Compassion	Lay-off Employees
Gave Time Off	Missed Opportunity
Getting Employees Back to Work	No Disaster Recovery Plan
Opened Alternate Location for Employees	No Repercussion on Tardy Employees
Organized Response by Employer	Not Following Plan
Payroll - Getting Employees Paid	Uncoordinated Employer Response
Provided Car and Gas	Unrealistic Disaster Recovery Plan
Provided Food	Phony Press Release
Provided Housing	
Provided Immunizations	
Providing Gas	
Valuing Employees	
Commitment to Clients	
Communication Plan	
Worked in Alternate City	
Compromise between Recovery & Employee's Needs	

4.5 Quantitative Methodology

The quantitative portion of this study consists of the collection and analysis of survey data from IT professionals employed in areas affected by Hurricane Katrina. In this section, the quantitative research methodology and data collection process are explained.

4.5.1 Web-based Survey

A survey design provides a quantitative description of trends, attitudes, or opinions of a population by studying a sample of that population (Creswell 2003). Surveys are the most popular method of data collection in information systems research (Newsted et al. 1998). Surveys enable researchers to collect data from a large number of participants that would not otherwise be possible utilizing other strategies. The systematic nature of survey questionnaires elicits information from participants in a reliable and unbiased manner (Marsh 1982). Survey results can be gathered in an accommodating manner for the application of sophisticated statistical techniques. Researchers are then able to generalize and make claims about the population of interest.

An online survey was created using Websurveyor and hosted at http://surveys.bus.lsu.edu/efm/wsb.dll. A web-based survey was particularly appropriate for canvassing IT professionals because of their familiarity with computers and access to the Internet. Items for the survey were taken from Lee et al. (1999) and modified as necessary. The complete survey can be viewed in Appendix A. An example of a modified item is below:

> Original: "If I had stayed, I would have been able to achieve most of my personal goals."
>
> Modified: "Staying with my pre-Katrina firm, I would be able to achieve most of my personal goals."

In addition to utilizing items from Lee et al. (1999), Niederman and Sumner's (2004) method of measuring Job Satisfaction Pre- and Post-shock was adopted for the survey. The flow of the survey instrument is depicted in the Figure 4-3.

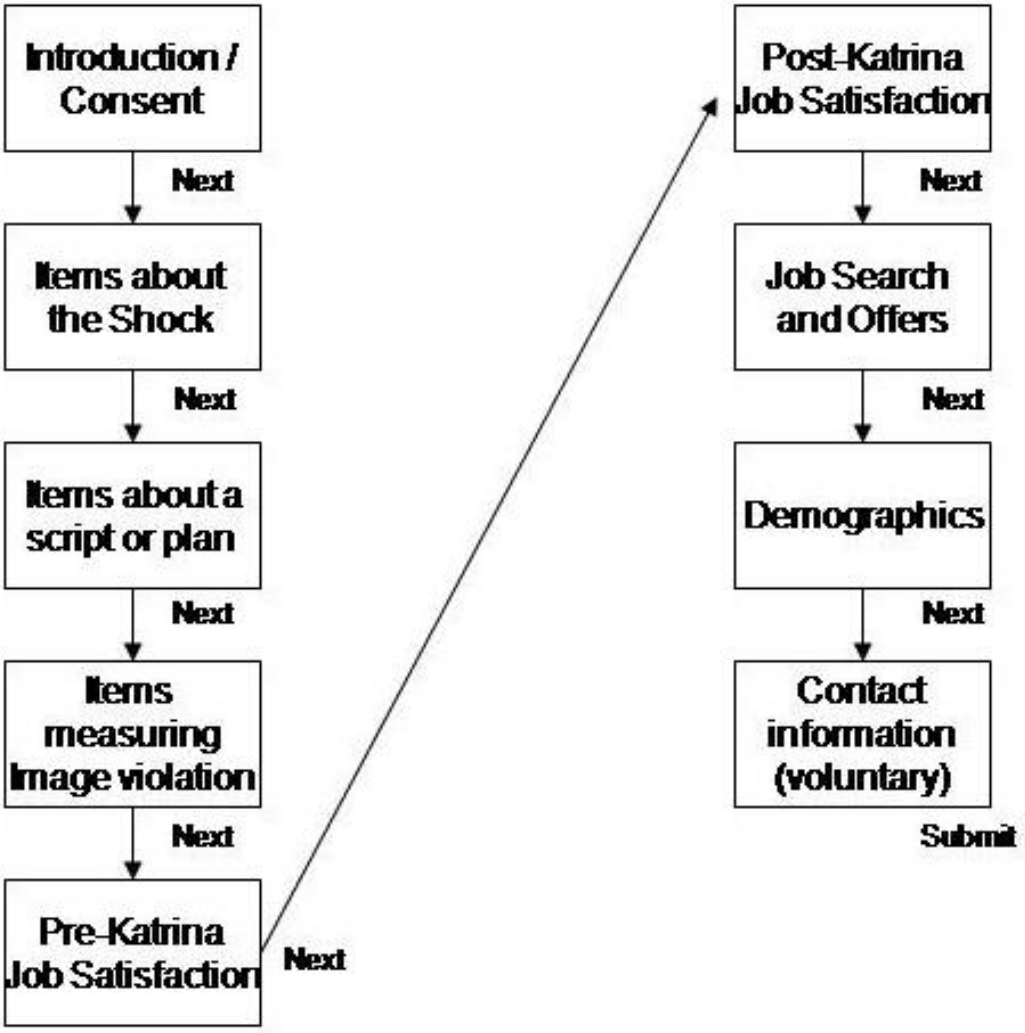

Figure 4-3: Flow of Survey Interface

Participants were solicited via an email explaining that IT professionals affected by Hurricane Katrina were being sought to complete a survey about their experiences. The email

included a hyperlink that opened a web browser to the online survey. The initial survey page displayed the purpose of the study along with a statement about informed consent as required by the LSU Institutional Review Board. Selecting the 'Next Page' button indicated a participant's consent to voluntarily participate in this study. The second page included questions about the participant's perception of Hurricane Katrina as a shock and inquired about quitting or switching jobs. After clicking on the 'Next Page' button, participants answered items about scripts and previous experiences. The next page asked questions about image violations. Items measuring pre-Katrina job satisfaction were next followed by the same items measuring post-Katrina job satisfaction. After job satisfaction, the participants answered questions about job searches and the evaluation of other alternatives. Clicking next brought participants to demographic questions and requests for location immediately before and after Hurricane Katrina along with current location. The last page thanked the IT professional for participating and asked for the opportunity to ask follow-up questions in an interview. If the participant wished to volunteer further, text boxes were available for the participant to submit their name, email address, and phone number.

4.5.2 Analysis

Survey responses were classified into either 1) the existing named paths in the Unfolding Model of Turnover identified by Lee et al. (1999) and Niederman et al. (2007), or 2) non-named paths in the model (to explore for emerging paths). More specifically, the dichotomizing procedures of Lee et al. (1999) first classified each participant's perception of Hurricane Katrina

as a shock or not a shock. Those identifying Hurricane Katrina as a shock were separated into those with a preexisting script and those without a preexisting script. This binary classification was continued for all variables in Lee and Mitchell's (1994) Unfolding Model of Turnover with each participant placed into a previously-named decision path or a non-named, potentially emergent path.

The dichotomizing procedures of Lee et al. (1999) are an automatic mapping and do not accommodate traditional statistical analysis on reliability. Lee et al. (1999) reported a 93% classification accuracy for their respondents following one of their theorized paths. Conversely, Niederman et al. (2007) found only a 12% classification accuracy to Lee and Mitchell's (1994) decision paths. Furthermore, Niederman et al. (2007) observed 3 new nontheorized paths representing 68% of their respondents. The quantitative analysis for this study consists of classifying the responses as described above then observing for trends, anomalies, and further emergent paths. The results and classification portions were then compared against Lee et al. (1999) and Niederman et al. (2007) as described in the following chapter.

4.6 Conducting the Research Study

As stated earlier, a mixed methods approach was utilized for conducting this study. Using a concurrent nested strategy, the predominant method guiding the study is qualitative with the quantitative method nested to address one of the research questions at a different level. Data from both methods was considered during collection and analyzed at each phase to better inform data collection for subsequent phases.

Figure 4-4: Diagram of the Phases

Participants were initially solicited to participate in the web-based survey. Using a participant's survey responses, selected IT professionals were sent an email request to participate in an interview. The next chapter includes a comprehensive discussion of the data analysis used in the study, as well as the approaches utilized to explore each of the research questions.

CHAPTER 5: RESEARCH FINDINGS

In this chapter, the results of the study are presented. First, the emergent themes identified from the interviews are presented and discussed. Next, the findings from the survey are presented and discussed.

5.1 Themes

Theme 1: All of the employees who stayed with their pre-Katrina employer identified positive actions their employers took to show compassion.

Of the 19 participants interviewed, 13 were still with their pre-Katrina employer. Each of those employees identified one or more positive actions taken by their employer during the events surrounding Hurricane Katrina. They perceived these actions as demonstrations of the employer's empathy and compassion. Specific actions identified by the stayers included:

1. Time off. Receiving time off was important because it allowed the employees to fully concentrate on personal matters such as damaged property and childcare. The interviewed employees perceived this as a positive act on the part of their employers. To them, their employer was acknowledging one of their immediate needs.

    - "Yeah…they took care of us. They understood that if you needed to take care of stuff at your house, they let you do it." – Analyst, New Orleans, LA

    - "I think just the two companies initially offering to give, you know, time off to the employees without having to pay it back, at least at first, helped a lot of people feel at ease." - Project Lead, Biloxi, MS

    - "They did, [employer name removed] is my employer, and they gave us two weeks without charging us." – Software Manager, Biloxi, MS

2. Compensation. Additional compensation served two purposes. First, it provided recognition and reward to the employees who either stayed behind or promptly returned to help with the organization's recovery. Second, it provided additional funding for the employee's personal recovery efforts. For example, with an estimated five million people without electricity, many of the respondents reported utilizing generators for extended periods.

   – "They fought with FEMA to get us time and a half for working-overtime for the month of September. If you worked, you got time and a half." - GIS Analyst, New Orleans, LA

   – "You know…I don't have any complains. I thought I was treated fairly and the organization treated me well. So, you know…they gave us a stipend. They gave everybody some money." – Analyst, New Orleans, LA

   – "I got paid overtime for the whole time. I was compensated for what I worked. It was like getting paid for 24 hours [per day] for the first two weeks. " – Network Administrator, Long Beach, MS

3. Provided gas. Because of the damaged infrastructure, many of the normal supply systems were disrupted so fuel and other essential items were in short supply. Several participants reported that their employers provided fuel enabling their commute to work.

   – "As employees we had…we could come…they offered to provide gas for us…food, water." – Database Administrator, Pascagoula, MS

   – "[Employer name removed] even had a truck come out for their employees to get gas. So we could get some gas while we were there. That was very beneficial…otherwise, we couldn't get gas." - Senior Database Administrator, Bay St. Louis, MS

4. Housing. Along the Gulf Coast, Hurricane Katrina caused major damage to over 275,000 homes and displaced over 780,000 people (Strauss 2005). Many employees reported their employers provided temporary solutions without which they may have been forced to leave.

   – "It was a corporate apartment that someone from my company was not using. We were put up in that for free of charge for four months while our house was being repaired…" – Consultant, New Orleans, LA

   – My employer is [employer's name removed] and they got us, my wife and myself, a hotel in Baton Rouge…a hotel room. While they were working out of Baton Rouge for 3 months. Which I really was appreciative to have a place to stay because we didn't know where to go." – Information Analyst, New Orleans, LA

5. Childcare. In areas experiencing the heaviest damage, schools and daycare centers were closed for weeks (or even months). Without childcare, the employees would not have been able to focus on work issues.

    – "For childcare, they actually brought in a childcare center that was offsite and brought it onsite for…gosh, almost 3 or 4 months. They let them use our facilities and take care of all the kids …." – Software Analyst, Metairie, LA

    – "We had HR personnel working a daycare center." – Assistant Director of IS, Jackson, MS

The employer actions listed above were significant because in the absence of certain items, such as gasoline, employees would not be able to commute. Employees experiencing a natural disaster are immediately burdened with the inherent responsibilities of providing for their family. Positive actions such as providing housing, childcare, and monetary assistance allow employees to recuperate faster and in turn, become more productive. Additionally, participants articulated various other positive actions on the part of employers that demonstrated compassion:

    – "Yeah. Here is another thing that happened at [name of organization removed] right after the storm. Everyone that stayed behind got free shots…tetanus, hepatitis. They provided all that." – DBA, Pass Christian, MS

    – "They sent down…several of the people I work with got clothes and everything… They sent down phone cards. They sent down prepaid cell phones. There were a lot of things they did." – Software Consultant, New Orleans, LA

Interestingly, all of the above mentioned actions happened without any type of contract stipulating that employers would provide any such assistance nor were there of any provisions in the organizational policies for providing assistance to employees.

Rousseau et al. (1998) define a psychological contract as "an individual's belief in mutual obligations between that person and another party such as an employer." The findings of

this study indicate that, from the employees' perspective, employers have an obligation to their employees after a natural disaster. One employee had this to say when asked a follow-up question about expectations of his employer following a natural disaster:

- "Absolutely. I have expectations of my organization. Foremost, they need a plan and then they need to realize that plan involves people….people who have families and homes." – IT Specialist, Gonzales, LA

With few exceptions, the actions benefited and were available to all employees. However, there were some examples of employees with critical skills being given priority.

- "Well, they put up the key people and I'm a key support person. Since I support a lot of the big systems they put my wife and myself up. And paid for everything." – IT Analyst, New Orleans, LA
- "We were, again I don't recall exactly, but we were pretty high in priority. Cause they got to have the IT working." – Assistant Director of Networks, Jackson, MS

While some of these actions were initiated by a supervisor or manager, the ultimate responsibility for positive actions rested with the employer, i.e., top management. Here is the view from an upper-level management perspective:

- "One of the main issues…if there is a storm I can make all the promises in the world to my guys but in the end they are going to pick their families over the job. And that's reality." – Managing Partner, New Orleans, LA

Theme 2: Some employees who left their pre-Katrina employer felt that the employer could, or should, have done something to keep them.

All of the leavers, except one, identified actions their employer could have taken to retain them as employees. Each person described specific actions in the aftermath of Hurricane Katrina

that would have kept them from leaving. The identified actions ranged from something as simple, but very important to the employee, as recognition for their dedication and hard work to monetary compensation. To the employee, their employer's inaction revealed apathy towards them and their needs.

One of the more striking experiences was relayed by a network specialist working for a large financial organization in Mississippi. Before Hurricane Katrina, he described himself as a committed employee with no thoughts of quitting. While not considered part of the disaster management team, as the storm approached he received a phone call at home and was given less than 24 hours notice that he was needed at the off-site data recovery location in Chicago. Once Hurricane Katrina hit the coast, he lost contact with his family. After several days he asked his supervisor, who was still in Mississippi, to check on his family who lived very close to one of the branches.

> "All I'm asking...I know you have people checking the branches. That is one of the first things that happens. You have people assigned to go check the branches...have them drive the block to check on my family." His supervisor's response was "Nope, we don't have time for that. We have too many other things to do."

In this situation, the employee was separated from his family with minimal notice and then his employer displayed complete indifference to his needs and requests. For this particular employee, his employer's inaction demonstrated apathy toward his needs and concerns, "You guys asked me to come up here. You separated me from my family. The least you can do is go check on them."

Accordingly, most of the leavers said they made the decision to leave because their employers failed to take necessary steps to prevent their turnover. Perhaps not all turnover is preventable but the only employee who felt there was no action her employer could have taken to prevent her leaving, made the decision to leave prior to Katrina because of preexisting financial reasons. In each of the other instances of turnover, all it may have taken for the employers to keep their employees were actions that clearly demonstrated compassion and concern. For the network specialist mentioned above, he felt that all it would have required to keep him was either two plane tickets sending his wife and daughter to Chicago with him or for someone from the corporate office to check on their status when they remained behind in the disaster area.

Another example comes from a software engineer working in Long Beach, MS for what he called a "small business" with a large web presence. This individual had basically saved the business after responding to a phone call from an evacuated colleague saying:

> "Hey, the hurricane is coming our way you need to go to the office and see what you can do."
>
> "And so I went down there and put PCs up on desks which saved them because we did have flooding. I also backed up the server to an external hard drive. And that was basically our disaster recovery plan."

His actions "basically saved the business" but he felt his employer did not treat him and the other employees with empathy and failed to take any actions to recognize or reward this work.

> "No. He really didn't do anything. He was under so much stress himself. I don't think he could see beyond his own problems and his business. He didn't empathize with his employees."

Out of a sense of obligation, this software engineer stayed to help his employer move and setup a data center at a new location before finally leaving the company.

Theme 2a: A complete loss of trust also contributed to decisions to leave an employer.

Closely correlated with the perceptions of employer apathy discussed above were examples of a complete loss of trust towards an organization. A major difference between experiencing employer apathy versus a complete loss of trust was the magnitude and frequency of the employer's negative actions (or inactions). A software engineer from Long Beach, MS had this to say about his employer,

> "By the time I was ready to leave, there is no way he could have offered me enough. That was because I didn't trust him and what I had to say couldn't get through to him."

This employee stayed with his pre-Katrina employer for a year after the storm and had endured multiple broken promises of raises and bonuses after the business was "back up and running in the new office." Once again, before Hurricane Katrina this employee had considered himself a committed employee and it was his dedication that kept him there when the majority of the IT staff left much earlier.

Theme 3: A portion of the turnover was specific to the impacts of the storm and not employer actions.

Some of the turnover discussed in the interviews was attributed directly to Hurricane Katrina and not to any type of employer or organizational actions. Lack of affordable housing and family issues were two main reasons given. David Wilson, President of The National Association of Home Builders, along with representatives from the Red Cross and other relief agencies testified to a congressional committee that approximately 275,000 homes were

destroyed in Louisiana, Mississippi and Alabama due to Hurricane Katrina (Strauss 2005). Without any immediate means of shelter, thousands of Gulf Coast residents were forced to evacuate and seek housing elsewhere.

Most of the interviews where turnover was described as a consequence of destroyed homes were participants reflecting on the turnover within their organizations and not their own particular circumstances. Several of the participants were able to live with nearby friends, family, or other forms of shelter such as FEMA trailers. Here is what one participant said when questioned about turnover in his organization, "We've lost a few people and the reason we lost them, or so they say, is because they have young families and they can't find…they want to buy a new house. They could not find affordable housing in the New Orleans area."

Family concerns and job conflicts created by Hurricane Katrina were a cause of turnover noted by two of the interviewees. One of the participants was a consultant living in New Orleans. Her consulting position required considerable travel and this caused conflict with the needs of her family:

> "Traveling during that time…dealing with childcare…my husband needing time to find a job because his office had been destroyed. I just couldn't travel as much as I used to for my job."

As a result, she resigned from the consulting company and took what she described as "a local job that was a pretty good cut in pay but there was no travel involved." Interestingly, the consulting firm she left eventually hired her back in a non-traveling position.

One unusual case involved a participant who left her pre-Katrina employer in another region of the country and moved to the Mississippi Gulf Coast following the hurricane. She was working in Denver as a database administrator for a large defense contractor and returned to Mississippi briefly after Hurricane Katrina to bring supplies to family and help evacuate her pregnant daughter-in-law and grandson. During the visit, the participant and her husband were so moved by the destruction and the need that within months they had sold their house in Denver and moved to Pascagoula, MS. According to her, "I kept telling my husband there had to be something we have in our skill set we can use to help." So great was her desire to participate in the rebuilding process that she took a lower paying job, "The pay, I have to say, is probably…you know… so low. It's ridiculous compared to what I was making in Denver."

Theme 4: Camaraderie and morale remained high in organizations with low turnover.

Camaraderie is defined as "a spirit of friendly good-fellowship" (Merriam-Webster's Dictionary). While this may be the official definition according to the Queen's English, employees in organizations with low turnover experienced a fellowship that went beyond social familiarity and typifies bonds associated with military units that have served together in a particular experience such as combat (Crocker 1993, p.83). Faced with the challenges involved with the recovery, employees took the initiative to help each other. For many of the participants, the adversity and mutual experiences brought the organization's employees closer together, "we helped each other under circumstances that we wouldn't normally deal with…got to know each other a little more…stronger bonds." – Software Manager, Biloxi, MS.

As stated earlier, many of the IT employees along the Gulf Coast had homes or apartments that were destroyed or otherwise non-inhabitable. Many of those interviewed who stayed with their pre-Katrina employer described employees helping each other with a place to stay. As a project lead from Biloxi described the situation, "People that had places were like 'hey, if you want to crash, that's fine' and started setting that up."

Sirota et al. (2008) found that camaraderie helps employees regain or sustain their enthusiasm for their work. A managing partner at a software consulting group based in New Orleans described his proudest accomplishment after Hurricane Katrina as retaining all of his employees, "It's the thing I'm proudest of…I've had no turnover. None." He did admit to firing a couple of IT employees since Hurricane Katrina but they were hired after the storm. Furthermore, he described the trust that was developed because of their experiences, "…there was the core group that stuck around during Katrina and we are real tight. We call it the [company name] old school…After all that bullshit, I know I can trust those guys."

Theme 5: A level of animosity developed between employees who stayed and those who evacuated and did not return within a reasonable timeframe.

While some IT professionals chose to stay in the disaster area during Hurricane Katrina and throughout the recovery process, others opted to evacuate to areas less affected by the storm. Of the employees who evacuated, there was a perception that some employees took great effort to return as soon as possible while the effort made by others to return was much less. Perhaps this would not normally be an issue but it was very common after Hurricane Katrina for organizations to continue paying evacuated employees. This was especially true for

governmental agencies where evacuated employees continued to receive the same pay and benefits as employees who stayed and worked.

Immediately after the storm, the affected areas suffered a lack of housing, damaged infrastructure, and quite possibly an unsafe environment due to looting, etc. Even with these obstacles, certain motivated employees took the initiative and quickly returned to work while others returned as soon as possible. There was, however, a portion of the employees that other employees perceived as taking the opportunity to abuse the goodwill of their employers and had an "extended vacation" while still receiving full time pay. Because many of those absent employees were still getting paid while other employees were working hard trying to recover and deal with the storm's aftermath, feelings of animosity developed between the two groups of employees. Even worse it created animosity between the employees and their employer.

> "Because while some of us were working our asses off, others were having a vacation. Without telling them to come home and start getting your shit in order." – IT Analyst, New Orleans, LA

A system administrator attributed the animosity created towards his employer over this issue as the catalyst for his decision to quit.

> "I wanted to be back there helping get things going. So I was the first one back, some others started to trickle back. This is what started my problem…some people didn't come back for like weeks. They could have made it back but they just took an extended vacation."

Theme 6: Many employees were allowed to stay, or live, at their organizations for a period of time, and most of these employees are still with their pre-Katrina employer.

As discussed previously, housing was a major issue for some employees and there were limited options available. Consequently, many IT professionals were allowed to 'live' at their organizations. This arrangement provided shelter for the employee but it was also a benefit for the organization since they now had 24 hour access to their IT staff.

> "We had cots set up in the rooms and different places to sleep. You really stayed there as much as you could. We didn't have many technicians at the time. So whoever could stay and help 24 hours stayed to help. When you needed some sleep find a room, sleep on a cot, eat a little, then come back and stay on a coffee diet as much as possible and help everybody out." – IT Support Technician, Gonzales, LA

Additionally, there were IT professionals who preferred to stay at work even though they had other options. Although they gave many reasons for doing so, the most prevalent was because there were more amenities at work compared to home such as: electricity, running water, Internet access, working phones, etc.

> "Of course, there wasn't any power at the house. So we had generator power at work so I slept in my cubicle for the first week I was back." – Database Administrator, Bay St. Louis, MS

Living, or staying, at the organization's facilities also helped the employees conserve scarce gasoline and avoid traffic on congested highways.

Theme 6a: Additionally, some employees were allowed to bring their families with them, and all of those employees are still with their pre-Katrina employer.

Some IT employees took the concept of 'living' at work a step further and brought their families with them.

> "One thing I was able to do….I had an office as opposed to a cube. What I did was on the night of the storm I brought my wife and son. They camped out in my office." – Assistant Director, Jackson, MS

> "There were three people that stayed there to ride out the storm. They brought their families out there. They brought their families to the site." – Software Developer, Gulfport, MS

When asked how their company's disaster management plans had changed pre- and post-Katrina, several of the participants commented that families were now included in the recovery plan. Once again, this arrangement can be a win-win for the employee and employer. The employee knows that his or her family is safe and can better concentrate on the organization's IT problems.

Theme 7: Two of the participants mentioned their military service and how it prepared them to cope with the aftermath of Hurricane Katrina.

During one of the interviews, the participant, who was a career officer in the Air National Guard, made a statement about how she could appreciate the efforts of her employer because she had participated in similar logistical operations with her military service. This was intriguing and further inquiry was made about her military service and whether that helped her cope with the aftermath of Hurricane Katrina. Here is her response:

> "Definitely, my military background helped to cope with life in the 2-3 weeks after Katrina. Camping skills, living/bathing/sleeping without the comforts of A/C, hot water, etc.; assessing resources and making best use of what we had; figuring out how to communicate with cell phones partially operational, cable out, phone out; Operational Risk Management training to assess and mitigate risk (travel, haul debris, cut and haul tree limbs, etc.); planning and carrying out plans, tending to emotional needs of kids, performing physical labor and toughing it out. Being in decent physical shape is so important in dealing with any stressful and harsh situation. People get so soft when they NEVER have to face any hardships. One of the BEST applications of military experience to something like Katrina is teamwork, camaraderie, helping each other out. In the military you're always above some, and below some, constantly the leader or the follower, and you learn to respect and adapt to all. That makes it easy to pitch in and help someone tear their house apart, or offer a room, or financial aid, without feeling like

> it's demeaning to anyone. You just draw together and take turns being strong or accepting help, whichever position you are in." – Software Testing Manager, Biloxi, MS

She also had this to say about military families and their preparation for possible deployments:

> "The Air Force requires a Family Care Plan for dual military couples with dependents (which we were, for many years), which includes long term and short term caregivers for dependents, having medication and medical care lined up, power of attorney, etc. – this got us in the habit of having the necessary documents in order and in safekeeping, and thinking ahead to make sure our own needs are taken care of."

The only other participant to mention military service was a database administrator who had retired from the U.S. Navy. While he was not as descriptive as the participant above, he felt the discipline developed over his military career helped him focus on his job instead of "everything else." He also agreed that while some of the documents might need to be updated, he maintained important paperwork such as a will, power of attorney, birth certificates, etc. that were safeguarded but readily accessible by his family. Although the experiences of two IT professionals with military experience do not provide sufficient evidence for any type of bold conclusions, it does provide insights and offer a direction for disaster management planning.

5.2 Quantitative Analysis and Findings

This section provides a comprehensive discussion of the online survey, the quantitative analysis techniques utilized, and the results obtained. First, response rate and treatment of missing data are discussed. Second, sample characteristics are reported. Third, the steps taken to classify each response are explained. Lastly, the statistical tests performed to test the classification proportions are discussed along with a presentation of the results.

5.2.1 Survey Response

The sampling frame for this study consisted of IT professionals in areas that were affected by Hurricane Katrina. Initial participation was solicited through the Association of Information Technology Professionals (AITP). Through coordination with the AITP, a solicitation email was sent to all non-student AITP members located in Louisiana, Mississippi, Texas, and Alabama. The contribution from the AITP member solicitation only resulted in 30 survey participants. Participation was also solicited via SQL Server, .NET, Oracle, and Java user groups located along the Gulf Coast along with the Louisiana Council of Information Services Directors (CISD), an organization of IT leaders in state agencies and public universities in Louisiana.

In order to increase the number of survey responses, a snowball sampling methodology was utilized. Snowball sampling is a technique for developing a research sample where existing subjects recruit future subjects from among their acquaintances (Salganik and Heckathorn 2004). The snowball method yields a sample based on referrals made by people who share or know others who present the characteristics that are of research interest (Biernacki and Waldford 1981). During the final section of the survey, participants were thanked for their participation, ensured of their confidentiality and then given the opportunity to provide contact information for follow up questions. A majority (56.2%) of the respondents submitted at least their email address. Along with a courtesy email thanking them for their participation, respondents were asked to forward the survey URL to other IT professionals who had been affected by Hurricane

Katrina. In this study, the snowball technique seemed to be particularly useful and appeared to result in an increase of survey responses.

In total, 159 responses were collected via the web-based survey. 6 surveys were discarded for incomplete data related to the unfolding model's constructs. This left 153 usable surveys for analysis. The classification procedure developed by Lee et al. (1999) requires complete cases so responses with missing data offered minimal value. Missing data occurs because a responding individual failed to provide acceptable responses to one or more of the survey items (Brick and Kalton 1996). If inclined, a participant could skip a question, there could be a system malfunction, or the user could simply close the web browser. While several alternatives have been offered (Cohen and Cohen 1983; Little and Rubin 1987; Allison 2002), listwise deletion or omitting cases with missing data remains the most common method for handling missing data (Dunning and Freedman 2008) and was judged the most appropriate given the type of analysis method to be used.

5.2.2 Sample Characteristics

As stated earlier, the final sample consisted of responses from 153 IT professionals who were affected by Hurricane Katrina. All of the respondents, except one, reported their gender with 72.4% (N=110) males and 27.6% (N=42) females. Table 5-1 summarizes the ages of the participants.

Survey participants were prompted to provide their pre-Katrina job title via an open text box. Participants listed multiple variations of common IT job titles with IT analyst, programmer,

Table 5-1: Participant Age

Number of Participants	Age Range
6	18 - 24
52	25 - 34
42	35 - 54
18	55 - 64
1	65 or older

Survey participants were prompted to provide their pre-Katrina job title via an open text box. Participants listed multiple variations of common IT job titles with IT analyst, programmer, network administrator, database administrator, and software engineer being the more common titles. The IT profession suffers from a lack of consistency in terminology describing the jobs within the field but a visual inspection revealed that all of the job titles fell within the IT domain as defined by previous studies (Igbaria et al. 1994; Todd et al. 1995; King and Sethi 1998; Moore 2000).

The lack of consistent terminology creates a barrier when classifying the respondents by job title. As responses were collected, the participants' reported job titles were monitored for relevancy and diversity. Likewise, the job function characteristic was also captured and the participant was forced to choose via a list of job functions. This characteristic was monitored for diversity also.

Table 5-2: Participant Job Function

Number of Participants	Job Function	Examples of Participant Listed Job Titles
52	Trained Professional	Application Developer, Software Engineer, Database Administrator, WAN Specialist
23	Middle Management	IT Site Operations Manager, Software Testing Manager, Assistant Director
18	Support Staff	Senior DBA, Systems Administrator, Assistant Network Administrator, Computer Programmer 3
15	Upper Management	CIO, Managing Partner, AVP of Information Technology
11	Consultant	Project Engineer, Senior IT Consultant, Systems Engineer
10	Junior Management	Manager, Project Leader, Senior System Architect
10	Administrative Staff	DP Director, IT Tech Support Specialist, Solution Consultant
9	Other	IT Tech, Systems Administrator, Software Engineer
2	Trainee	N/A
1	Self-employed / Partner	Owner
1	Temporary Employee	IT Specialist
1	Researcher	R&D Programmer

The target population for this study was IT professionals living in one of the states affected by Hurricane Katrina (Louisiana, Mississippi, Texas, and Alabama). Participants were asked to list the city they were living in (a) before Hurricane Katrina, (b) immediately after Hurricane Katrina, and (c) their current location. Three respondents did not specify a location but were still included in the sample because responses to survey questions indicated they were

affected by Hurricane Katrina. The remaining participants were employed in Louisiana, Mississippi, Texas, or Alabama either before Hurricane Katrina or during the subsequent recovery. In most cases, the participants were living in affected areas during the duration of the crisis. 4 of the participants were living outside of the Gulf Coast during Hurricane Katrina and moved to one of the affected states during the recovery process. Table 5-3 summarizes participant locations.

Table 5-3: Participant Location

State	Before Hurricane Katrina	Immediately After Hurricane Katrina	Current Location
Louisiana	95	91	92
Mississippi	28	24	29
Texas	19	22	22
Alabama	4	4	4
Other	4	9	3
Did not specify	3	3	3

5.2.3 Path Analysis

Utilizing the dichotomizing procedures of Lee et al. (1999), each respondent was classified on each variable in the Unfolding Model of Turnover. Lee and Mitchell (1994) identified the progression of five decision processes in their turnover model as designated turnover paths and in a subsequent study (Lee et al. 1999) they were able to classify over 92% of the turnover into those named paths. For the purpose of this investigation, the unfolding model

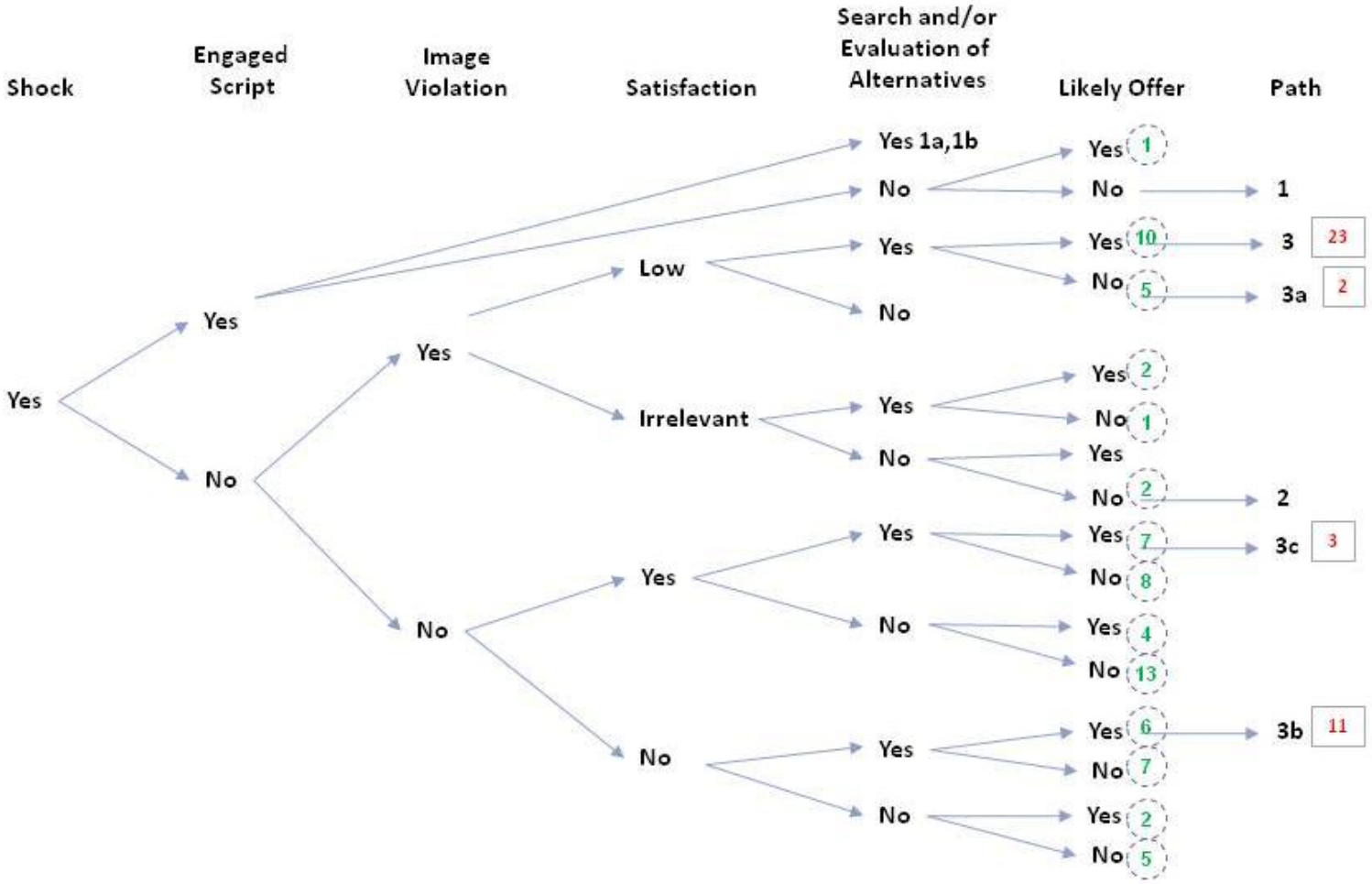

Figure 5-1: Expanded Unfolding Model of Turnover – Classification of Survey Responses

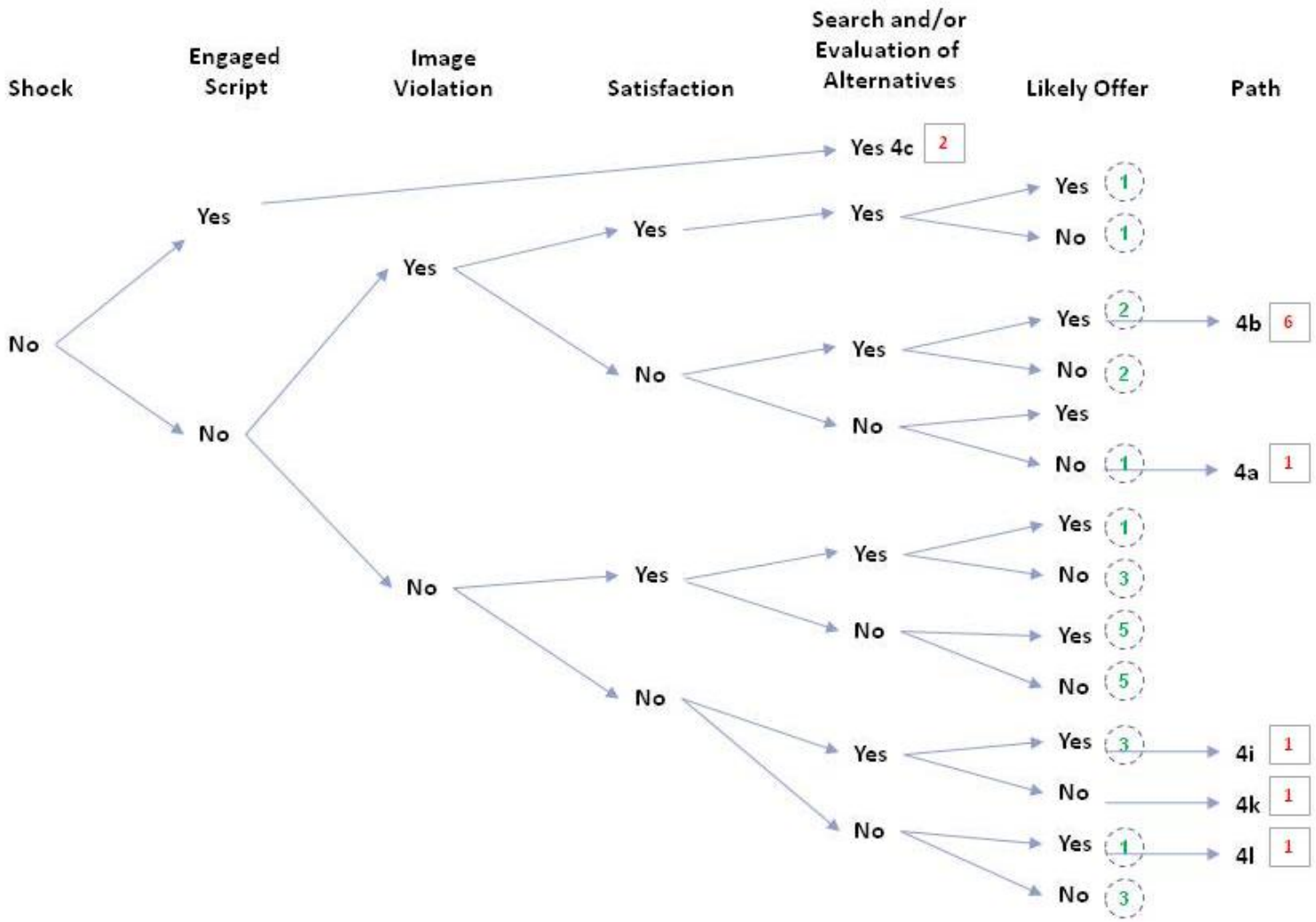

Figure 5-2: Expanded Unfolding Model of Turnover – Classification of Survey Responses (continued)

Note: Paths 3c & 4l were added during this study. All other named paths were identified during previous research. The circles indicate the number of stayers and the boxes indicate the number of leavers.

was expanded, as documented in Niederman et al. (2007), such that all survey respondents were classified. A visual representation of the classification can be seen in Figures 5-1 and 5-2.

Of the 51 subjects who left their pre-Katrina employers, 30 (58.8%) followed one of Lee et al.'s (1999) theorized paths (3, 4a, and 4b). With the inclusion of three emergent paths (1a, 1b, and 4c) from Niederman et al. (2007), the classification rate increased by 2 participants to 62.7%. Additionally, Niederman et al. (2007) further named several paths during their classification that identified the turnover path of some respondents but failed to meet their criteria as 'emergent.' One of Niederman et al.'s (2007) non-significant paths was identified as '3b' and can be seen in Figure 5-1. Interestingly, 11 (21.6%) of the leavers from this study were categorized into path 3b. Inclusion of the emerging path 3b increases the Unfolding Model of Turnover's classification rate to 84%. Building on Niederman et al.'s (2007) expanded path classifications, two additional paths were added, path 3c and path 4l, in order to complete the categorizing process. See Table 5-4 for a complete classification of all leavers.

Participation in this study was open to all IT professionals affected by Hurricane Katrina regardless of their employment status since the storm (i.e., survey respondents included leavers and stayers). This was a deliberate design decision to identify not only the paths taken by employees who left their pre-Katrina employer but to identify other employees who had stayed but were potentially 'at risk' of quitting at some point. Since this study did not exclusively target IT professionals who left their employers, the appropriateness of using the unfolding model to study a sample where 66.7% of the participants are still with their pre-Katrina employer needs to

Table 5-4: Path Frequency for Leavers

Path	Shock	Engaged Script	Image Violation	Job Satisfaction	Search for Alternatives	Job Offers	Frequency
3	Yes	No	Yes	Low	Yes	Yes	23
3a	Yes	No	Yes	Low	No	No	2
3b	Yes	No	No	Low	Yes	Yes	11
3c	Yes	No	No	High	Yes	Yes	3
4a	No	No	Yes	Low	No	No	1
4b	No	No	Yes	Low	Yes	Yes	6
4c	No	Yes	N/A	N/A	N/A	N/A	2
4i	No	No	No	Low	Yes	Yes	1
4k	No	No	No	Low	Yes	No	1
4l	No	No	No	Low	No	Yes	1

be addressed. Lee and Mitchell's (1994) Unfolding Model of Turnover has its foundations in image theory and the suggestion that the turnover process is apt to be initiated by a jarring event. For this study, 97.3 % of the participants (with 80% from LA and MS) were living in affected areas when the most destructive natural disaster in the history of our country occurred. The majority of the IT professionals surveyed had either received other job offers (52.9%) and/or

evaluated other job alternatives (51.3%). Therefore, individuals in this study were subject to the simultaneous strain of 'push' and 'pull' pressures that the unfolding model was conceived to examine.

As stated earlier, 102 (66.7%) of the 153 survey participants were still with their pre-Katrina employer. The application of the Unfolding Model of Turnover (Lee and Mitchell 1994) was extended to include the stayers, who were classified using the same procedure as the leavers described above. As would be expected, the majority of stayers were classified into non-named paths with no theoretical indications toward turnover. Interestingly, however, 37 (36.2%) of the 102 stayers were classified into one of the named paths where one or more of their counterparts in the study made the decision to leave. Perhaps it would be appropriate to categorize these employees as 'at risk' for turnover during the disaster recovery. As an example, consider the 10 stayers classified into path 3 (a popular decision path in which 23 of the leavers were categorized). Path 3 describes the cognitive process for employees who have (1) experienced a shock, (2) indicated an image violation, (3) expressed low job satisfaction, (4) searched for and (5) have been received other job offers. That is compelling evidence for identifying this as an 'at risk' population, raising questions about the difference in outcomes.

5.2.4 Statistical Analysis

A chi-square test was conducted to compare the path classifications from the current study with the findings from Lee et al. (1999). Under the null hypothesis that the proportions in

the present study conform to the findings from Lee et al. (1999), the respective probabilities for the named paths and expected number of classifications are displayed in Table 5-5.

Table 5-5: Observed and Expected Path Observations

Path	1	2	3	4a	4b	Unclassified	Total
Observed Number	0	0	23	1	6	11	51
Probability	2.62%	3.06%	59.39%	3.49%	24.02%	7.42%	100%
Expected Number	1.34	1.56	30.29	1.78	12.25	3.79	51

The test of the null hypothesis (H_0) is based on:

$$\chi^2 = \Sigma (O_i - E_i)^2 / E_i = (0 - 1.34)^2 / 1.34 + (0 - 1.56)^2 / 1.56 + (23 - 30.29)^2 / 30.29 + (1 - 1.78)^2 / 1.78 + (6 - 12.25)^2 / 12.25 + (11 - 3.79)^2 / 3.79$$

$$\chi^2 = 21.9$$

With K=6 categories, the degrees of freedom are K-1 = 5 and the critical value is $\chi^2_{5,0.005} = 16.75$.

Since the computed statistic, $\chi^2 = 21.9$, is larger than the critical value, $\chi^2_{5,0.005} = 16.75$, the null hypothesis is rejected. This data provides evidence that turnover patterns after a natural disaster may differ from normal turnover or emergent paths may explain additional turnover. This led to further analysis that is described in the following paragraphs.

Application of the original Lee et al. (1999) classification paths resulted in 30 classifiable quits (58.8%). Comparison indicates the classification success of leavers from this study is significantly less than the accountants from Lee et al. (1999) (χ^2 =84.9, p < .001). Inclusion of the 3 emergent paths from Niederman et al. (2007) only accounted for a net increase of 2 cases and was not statistically significant (+3.9%, χ^2 =0.32, p = 0.57). Visual inspection indicated that the inclusion of path 3b alone would account for a net increase of 11 cases (+21.5%, χ^2 =10.14, p < .001) which is a statistically significant increase in the number of classified leavers. While never classified as emergent, several other paths were identified and named by Niederman et al. (2007) during the classification process. Inclusion of three of those named but not emergent paths (3a, 4i, and 4k) accounted for a non-significant increase of 4 cases (+7.8%, χ^2 =2.37, p = 0.12).

Among the 4 individuals who could not be classified by the previously identified paths from Lee et al. (1999) and Niederman et al. (2007), only a single theoretical inconsistency in each case precluded classification. In particular, 3 leavers would have been classified into path 3b, but they indicated having high job satisfaction. Similarly, the last leaver would have been classified into path 4i except no job search was reported. For completeness, two additional named paths (3c and 4l) were added for categorizing the non-classified leavers. Statistically, the inclusion of these paths, 3c (+5.8%, χ^2 =2.44, p = 0.12) and 4l (+1.9%, χ^2 =1.02, p = 0.31), are not significant and only serves to reference the decision process of the otherwise unclassified leavers.

The frequency distribution of this study's sample into the unfolding model's paths suggests two additional points. First, the frequency distributions of the original Lee et al. (1999) paths were compared to this study. Using the null hypothesis (H_0) that the path frequencies for this study will not be statistically different from the distributions from Lee et al. (1999), chi-square tests were conducted on the proportions with a critical value of $\chi^2_{1,0.05} = 3.84$. There was no statistical difference between paths 1, 2, and 4b in the two studies ($\chi^2 = 1.38$, $p = 0.24$; $\chi^2 = 1.61$, $p = 0.20$; $\chi^2 = 0.35$, $p = 0.55$; respectively). In contrast, path 3 ($\chi^2 = 4.32$, $p < 0.04$) and path 4 ($\chi^2 = 4.20$, $p < 0.04$) occurred significantly less in current study as compared to Lee et al. (1999). These results suggest that the IT professionals affected by Hurricane Katrina have different patterns of (or paths for) leaving their jobs. Second, the sample sizes for paths 1, 2, and 4a among the IT professionals were somewhat small (with zero for paths 1 and 2) and may have precluded meaningful statistical tests (Keller 2008).

CHAPTER 6: DISCUSSION OF FINDINGS

This chapter presents a discussion of the findings from the data analysis presented in the previously. The research question will be represented and then sequentially addressed. Discussions about the findings, in relation to the research questions, will be based in the interviews, emergent themes observed from those interviews, and analysis from the web-based survey. Additionally, important trends and lessons will also be discussed.

6.1 Research Questions

RQ1: What factors influence turnover for IT professionals who experience a natural disaster?

a. Are there actions an employer can take to retain valuable IT professionals?
b. Are there employer actions that may drive away valuable IT professionals?

RQ2: What causes image violations for IT professionals experiencing a natural disaster?

c. Are the image violations based on the initial shock or aftershocks from the disaster? Or both?

RQ3: Which paths, present in the model or emergent, best describe the turnover of IT professionals who experience natural disaster?

6.1.1 Factors Influencing Turnover

The qualitative interviews revealed several factors that influenced turnover for the IT professionals affected by Hurricane Katrina. One of the foremost factors, if not the primary factor, involved the employee's ability to provide for their family. The interviewees expressed long- and short-term concerns about being separated from their families along with providing

housing for their families and childcare issues since many schools and daycare facilities were not operating for weeks (or months) after Hurricane Katrina. Several of the participants were concerned about their parents or other extended family members in need of care. With the shock of Hurricane Katrina, one common reaction of employees was to pause and reflect on the importance of family, expectations, and emerging work-family conflicts.

Work-family conflict is the role tension that occurs as work related stress interferes with the performance of family duties (Netemeyer et al. 2004). Juggling family and job duties is more difficult for employees experiencing a disaster since the demands from family and work are increasing simultaneously. Previous studies (Baroudi 1985; Moore 2000; Netemeyer et al. 2007) have presented models to explain the function of work-family conflict on an employee's turnover intention. Ahuja et al. (2007) present a model of work-family conflicts that adapts and incorporates relevant to work-family conflicts in the IT profession (See Figure 6-1). For the purposes of this discussion, the Ahuja et al. (2007) model will be used to demonstrate the role of work-family conflict in turnover (see Ahuja et al. 2007 for a detailed explanation of the model and construct definitions.)

6.1.2 Actions to Retain Valuable IT Professionals

Are there actions an employer can take to retain valuable IT professionals who have been affected by a natural disaster? The findings of this study provide strong indications that there are. Actions that demonstrated compassion toward the employees and their needs were positively perceived and communicated by all of the stayers who were interviewed for this study.

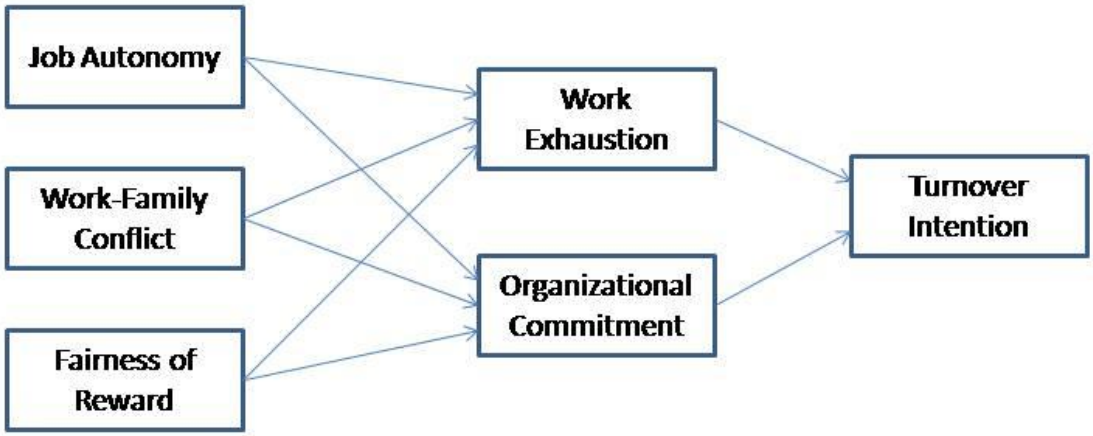

Figure 6-1: Ahuja et al. (2007) Model of Work-Family Conflict and Turnover

With family being a principal factor in turnover decisions, actions taken by an employer to mitigate an employee's perceived work-family conflict can facilitate retention. In addition, these employees may be likely to become more committed to the organization as evidenced by the experience of an IT consultant from New Orleans described below.

One of the study participants was living in New Orleans and working as an IT consultant for a large global consulting firm. Her position required 75% travel and she described her family situation as married with kids and lots of family in the area. Immediately after Hurricane Katrina, her house was severely damaged and she was able to take "my whole family to Houston…dogs, cats, everything" during on a consulting engagement. She continued working while her husband and family attempted to coordinate a more permanent solution. The situation continued as she was moved to another city for another assignment. Although she was otherwise

satisfied with her job and the organization, she left the consulting firm and took a lower paying job "to be close to home" and to assist with her family's recovery efforts.

Prior to leaving, this participant's organization had provided short-term housing accommodations to her (and other employees in the area) including starting a foundation that provided emergency funds, clothing, cell phones, etc. to affected employees and eventually to the Red Cross. Despite these efforts the work-family conflict remained and ultimately led to her resignation. When asked about the decision to quit, this was her response,

> "It was a really hard decision. I absolutely loved the company I worked for then and the show of support was unbelievable. That being said, it was a very traumatic time and I had a lot of family members that needed help…we needed help. Traveling during that time…dealing with childcare…my husband needing time to find a job because his office had been destroyed. I just couldn't travel as much as I used to for my job and my job was 75% travel requirement, sometimes 100% travel."

Not willing to concede losing a good IT consultant, her organization took notice and addressed the work-family issue by offering her position with much lighter travel requirements. Once the work-family conflict was resolved, she was able to resume her employment with the consulting firm.

> "It worked for me financially and career-wise and certainly they gained the loyalty of me and my entire family."

Not only did this employer regain a valuable IT professional, the organization will profit from a committed employee supported by her grateful family.

6.1.3 Actions that Drive Away IT Professionals

In contrast to the above scenario, are there employer actions that can drive away IT professionals affected by a natural disaster? Once again, the answer indicated by the study

results is that there are. Actions that show apathy towards employees' concerns and needs can definitely have a strong influence an employee's decision process. More specifically, if an employer's actions tend to create or magnify the work-family conflict, employee turnover may be very likely. Even if those employees do not leave immediately, the company must contend with a disgruntled employee who is at risk for leaving when given the opportunity.

The experiences of one of the participants provide a telling example of the negative effects of the actions taken by some employers. This IT professional was a network (WAN) specialist living on the Mississippi Gulf Coast and worked at the headquarters for a large regional bank. Like many other companies, his employer had a disaster management plan where several employees (mostly IT professionals) would evacuate to an off-site location and set up remote data management operations. Before Hurricane Katrina, he was not considered part of the disaster management team and was surprised when he received a call telling him that he was going to the off-site location in Chicago. When he asked about taking his family, he was told,

> "'Well, I can send you and your wife to Chicago.' So I said 'I have a daughter too!'. He was like 'can't send your daughter, you will have to pick your wife or your daughter'."

He acknowledged it was a rather odd response for his boss to tell him to pick between his wife and daughter. While at his office picking up some items before his flight, he discovered that some of the original employees on the off-site disaster management roster had refused to go and several of his colleagues had received similar last minute calls. He also discovered the reason why the company would only pay to send one additional person with him instead of both his wife and daughter. As a last minute replacement for another IT employee that refused, his

manager was only authorized to pay the airfare planned for the original team member, which included only one other family member.

This individual left his wife and daughter and deployed to the off-site location in Chicago because he considered himself a dedicated employee and partially because he did not realize the severity of the potential destruction or the duration of the recovery. As if his separation was not sufficient to create a severe work-family conflict, the organization refused to provide assistance when he lost contact with his family.

> "I tried for the better part of a day to get my immediate boss and when I finally got him on he starts giving me direction on which servers to recover. I said 'ok' we will do that but I need you to do this for me 'send somebody out to check on my family'. The last words I got from them was 'the water is rising'...that is kind of ominous.
>
> So he goes 'Nope, we don't have time for that'. I said ok look, we are a bank and we have bank branches all over the place. There is a bank branch a block from my house. All I'm asking...I know you have people checking the branches. That is one of the first things that happens. You have people assigned to go check the branches...have them drive the block to check on my family. And he goes 'Nope, we don't have time for that. We have too many other things to do.'"

Because he was one of the senior IT employees at the off-site location, this participant was in regular contact with the CIO and other executives inquiring about the recovery of certain applications. He discussed his situation with the CIO and made the same appeal for the organization to check on his family only to receive a similar response.

> "He goes 'Oh, they have too much to do over there. They don't have time for that.' I'm going 'wait a minute'. You guys asked me to come up here. You separated me from my family. The least you can do is go check on them. He goes 'Well, I understand but we are not going to do it.'"

The IT employee speculated that his situation was a consequence of his employer's rush to repeat their success after Hurricane Camille in 1969, when this particular bank gained a large amount of additional business from the recovery efforts with its assets growing 43% in four months (Grow 2005).

Although the actions of his employer were the reason he made the turnover decision, he did not immediately quit. After several days, he was able to communicate with his family through a friend and eventually evacuated them to stay with family located in another state. He continued his employment with the bank long enough to secure a new job before quitting. When informing his employer that he was quitting, he was offered a substantial bonus to remain with the organization and refused. When asked if there was anything the employer could have done at that point to keep him, his response was no because "They showed me their true colors." Of course, this is one of the more extreme examples of an employer taking actions that created (or did nothing to relieve) a work-family conflict but it creates a relevant contrast to the consulting firm that took extreme efforts to alleviate the work-family conflict of the participant described earlier.

6.1.4 Causes of Image Violations

Lee and Mitchell (1994, p. 59) define an image violation as an event that "occurs when an individual's values, goals, and strategies for goal attainment do not fit with those of the employing organization or those implied by the shock" and causing "conflict between life domains." They further describe the consequences of image violations as triggering "immediate, deep-seated, aversive impulses" with the possibility of leading to turnover. This

description of image violations is somewhat broad and is related to the concept of the violation of a psychological contract.

Rousseau (1989, p. 123) refers to a psychological contract as “an individual's beliefs regarding the terms and conditions of a reciprocal exchange agreement between that focal person and another party.” Foremost is the concept of a set of “reciprocal obligations” resulting from the belief of an agreement binding the employee/employer relationship. As one IT analyst from New Orleans described his company’s response to Hurricane Katrina, “You treat me right and I'll definitely treat you right.”

The relationship between image violations and psychological contract developed initially from a similarity between the constructs’ definitions and continued to develop in the course of this study as participants described their experiences after Hurricane Katrina. In some circumstances, the image violation was unmistakable but for the majority of leavers interviewed the violation was less pronounced, resembling a gradual reappraisal. Perhaps most convincing was the resemblance of the biblical parable in the introduction of Rousseau (1989) to the actual experiences of this study’s participants:

> . . . [T]he owner of an estate. . .went out at dawn to hire workmen for his vineyard. After reaching an agreement with them, he sent them out to his vineyard. He came out about midmorning and saw other men standing around the marketplace without work, so he said to them, "You two go along to my vineyard and I will pay you whatever is fair . . . " Finally, going out late in the afternoon he found still others standing around. To them he said, "Why have you been idle all day?" "No one has hired us," they told him. He said, "You go to the vineyard too." When evening came the owner of the vineyard said to his foreman, "Call the workmen and give them their pay . . . " When those hired late in the afternoon came up they received a full day's pay, and when the first group appeared they supposed they would get more; yet they received the same daily wage. Thereupon they complained to the owner... "My friends," he said in reply, "I do you no injustice. You

> agreed on the usual wage, did you not? Take your pay and go home. I intend to give this man who was hired last the same pay as you." (Matthew 20: 1-16).

As Rousseau (1989) so eloquently summed up the biblical parable “From the workers' perspective they have been inequitably treated; from the owner's viewpoint, ‘a deal is a deal’.”

> “We had several people in our office in New Orleans and had to be evacuated out. Two went to Memphis and one was in Utah. It was almost a month until they came back. They didn't lose their jobs and were getting paid the whole time. Because while some of us were working our asses off, others were having a vacation. Without telling them to come home and start getting your shit in order.” – IT Analyst, New Orleans.

In both of these stories, the important lesson is that expectations vary and can change with the situation. There was a tendency among some Gulf Coast employers to continue paying evacuated employees. Perhaps those employers did so out of a sense of obligation or maybe even as a method of self preservation hoping to retain the evacuated employees. Either way, the perception from the interviewees was that they were “working our asses off” while others were “having a vacation” while receiving the same pay.

Another, more subtle violation expressed by a participant was the loss of autonomy. This individual was an IT systems administrator, or as he described it “all around IT guy” for a large church in east Texas. He was not looking for an IT position at that particular organization but was drawn to the position because of the multitude of roles (programmer, network administrator, web publisher) he would perform, systems (LAN, wireless, security systems, audio/visual equipment) he was exposed to and the autonomy he would have in administering them.

As stated earlier, his organization was rather large and was registered as an evacuation facility for the Red Cross. Even before Hurricane Katrina hit the Gulf Coast, his organization

was receiving evacuees from Louisiana. It was during this time that the dynamics of his job began to change and he felt that his autonomy began to disappear.

> "I was placed under the direct supervision of somebody else…somebody who was basically an administrative assistant. They kind of dictated everything that I was supposed to do."

This change in autonomy violated one of the key reasons he took the job. After the change in autonomy, his outlook was "Like the crap they are putting me through isn't worth it anymore."

6.1.5 Basis for the Image Violation – Shock, Aftershock, or Both?

One of the interviewed leavers was a senior database administrator working for a large defense contractor in Denver. Her decision to leave was caused by a work-family conflict created by the circumstances surrounding by Hurricane Katrina. She was originally from the Mississippi Gulf Coast and still had family living there, including her mother and brother along with her son and his family. Within days after Hurricane Katrina, she and her husband loaded a truck with food, water, gas cans, generators, and other requested items and drove to Mississippi hoping to assist in the recovery efforts. Seeing the devastation firsthand made an impression on her.

> "When you have ties to the coast and you see what happened, it was hard to live with. You feel like you have to do something."

Having assisted with her family's immediate needs, she and her husband returned to Denver with her pregnant daughter-in-law and grandson.

This IT professional returned to work in Denver and found it difficult to express what she had seen and experienced to her employer and fellow workers.

> "It was so hard for me to explain to [defense contractor], to the group I was in, how bad it was because we came down that Saturday after the storm…[it] was like a third world country."

Her organization was understanding and even thought they were experiencing a "busy cycle" her employer offered to give her some additional time off but she felt she needed to do more.

> "So I had a really hard time dealing with it. I kept telling my husband there had to be something we have in our skill set we can use to help."

Because of some congressional budget cuts, her employer "had to do some major layoffs" and although she had already made the decision to quit, she postponed her decision hoping to get laid-off. As it turned out, only her husband was laid-off so she quit.

Interestingly, this participant's post-Katrina turnover experience does not end with her leaving Denver. After moving to the Mississippi Gulf Coast, the couple continued to assist her family in the recovery efforts. Instead of continuing to deplete their savings, she took a position with a federal agency located in the area.

> "I saw in the local paper there were jobs out at [government agency] and of course, I applied and immediately got the job. They just don't see my qualification very much in this area. Another bad sign is when they hire you that fast…it was a horrible job."

She stayed with the government agency for another 6 months and eventually left because she just could not adjust to the "back woods" IT department.

After a more careful search, she found a suitable job making what she describes as "considerably less" money than she was making in Denver. She is happy with her decision to leave Denver and move to the Gulf Coast because of (1) her family and (2) the satisfaction of helping in the recovery effort. When asked about her thoughts about how Hurricane Katrina

affected her, she responded that it caused her to "reevaluate" her situation and had she not seen the destruction with her own eyes "We would have never moved here." This participant's situation is unique in that she was not living in an area affected by Hurricane Katrina. In this case, the image violation she experienced, that initially caused her to quit and move away from Denver, was a direct result of the shock of Hurricane Katrina. This is a reminder that the 'shock waves' of an extreme event can extend far beyond the immediate area.

Another interesting experience came from an IT business analyst working at the emergency operations center (EOC) for a large petroleum company in Houston. This participant had previously worked for a global consulting firm and had a strong desire to help with technology to enable organizations to make better decisions. His position at the petroleum company included interviewing stakeholders to improve the organization's IT systems. In the days before Hurricane Katrina hit the Gulf Coast, he had been in New Orleans working with local management on the IT systems utilized for tracking storms in the gulf along with the decision process for evacuating and coordinating the evacuation of a drilling platform. He found the organization's process was disjointed and inefficient.

> "I actually realized that there were allot of deficiencies in the way the company does business from a technology perspective."

As an IT professional with a strong consulting background, he was particularly frustrated with the organization's technological inefficiencies.

His frustrations continued after he returned to the EOC and observed how the organization responded to the destruction of Hurricane Katrina.

> "I realized the EOC…the emergency operations center was…it was amazing how fragmented information can be in a company. And it's not until there is an unfortunate major catastrophe or an impending risk that the company is willing to make the necessary investments…even in technology."

He further described his frustration at the disjointed flow of information:

> "I don't want to call it 'willy nilly' but the decisions were based on ad hoc feelings. That is a major impact…a rig going down or the loss of crew. It is a major impact to the operator. A huge impact financially and also potential loss of life…which no one wants."

For this individual, the image violation was caused not by the shock of Hurricane Katrina but the aftershock of how his organization handled the situation. The inefficiencies of his organization's use of technology and potential negative impact, to include loss of life, made him feel as though his personal, professional, and career goals were completely non-compatible with his employer and led to his turnover decision.

All of the other interviewed leavers, except for the two mentioned above, described experiencing employer actions (or inactions) that created or aggravated a work-family conflict. Consequentially, their violations can be directly attributed to an aftershock created by the employer. As for answering the research question "Are the image violations based on the initial shock or aftershocks from the disaster? Or both?", the short answer would be that image violations can be based on either or both the shock of the disaster and the aftershocks resulting from an employer's actions. It is interesting to note that all of the leavers living and working in the areas that experienced the most damage described their image violation as being caused by their employer.

6.1.6 Turnover Paths

The combination of path 3, identified by Lee and Mitchell (1994), and path 3b, identified by Niederman et al. (2007), explains more than two-thirds of the turnover from this study. Interestingly, the two paths are similar with the only difference between them is that in path 3 the participant perceives an image violation and in path 3b the participant does not. As mentioned earlier, some of the interviewed participants described subtle image violations. Perhaps the image violation measures borrowed (and modified) from Lee et al. (1999) lack the sensitivity for identifying subtle violations and there is a need for more robust items to measure a violation. Both paths involve perceptions of low job satisfaction. This is especially interesting in path 3b since participants following this decision path did not perceive an image violation. This anomaly provides additional evidence pointing to the need for more robust image violation measures. Previous studies (Lee and Mitchell 1994; Lee et al. 1999; Niederman et al. 2007) suggest a high correlation between perceived image violations and perceived low job satisfaction. It is possible that path 3b identified (but not found emergent) by Niederman et al. (2007) is indeed an emergent path and useful in describing the turnover decision of employees experiencing a natural disaster. Additional research may provide further insights.

An additional note on the turnover paths from this study relates to the duration of the turnover decision process. Lee et al. (1999) hypothesized that turnover path 3 would have a longer duration than paths 1 and 2. Unexpectedly, they found no statistically significant increase in duration between paths 1, 2, and 3. While this study does not have any evidence to dispute the

Lee et al. (1999) non-significant finding on duration (this study did not have any leavers utilizing paths 1 or 2 for comparison), none of the participants quitting their pre-Katrina employers indicated leaving quickly. Even the network administrator who was sent to Chicago and separated from his family waited over 6 weeks before quitting.

6.2 Insights from the Military

An emergent theme from Chapter 5 came from two interviewed participants who felt that their military experience had better prepared them for dealing with the aftermath from Hurricane Katrina. As stated earlier, the experiences of those two participants do not provide ample evidence for any strong conclusions but it does provide insights and offer a possible direction for disaster management planning.

With the current operational tempo of our nation's military, it is not surprising to find that the majority of reservists, guardsmen, and veterans have experienced one or more recent deployments (Thompson 2007). This study encountered two such individuals; one participant is an officer in the Mississippi Air National Guard working as software testing manager in Biloxi and another participant was recently retired from the Navy and working as a database administrator in Bay St. Louis, MS. Both of the participants credited their military experience as a positive preparation for coping with the crisis of a natural disaster.

The first individual attributed physical fitness to her ability at handling the stress and harsh conditions following Hurricane Katrina.

> "Being in decent physical shape is so important in dealing with any stressful and harsh situation. People get so soft when they NEVER have to face any hardships."

She did not evacuate and was one of the few employees in her organization who stayed and worked throughout the crisis. She compared her living conditions immediately after Hurricane Katrina to "camping" since she was without electricity, air conditioning, and running water.

Initially, the second participant with a military background did evacuate to Dallas before the storm but was recalled after two days because his DBA skills were needed. When asked if he had any reservations about leaving his family, he stated,

> "Are you kidding? With all the deployments I've done, my family is very capable…we're almost used to it."

He also seemed very comfortable driving back into a disaster zone and living in harsh conditions. He called it "discipline" and said his previous experienced helped him concentrate on the job at hand.

Members of the military (active and reserve) are required to develop a Family Care Plan. The plan is geared toward single soldiers and families with dual military membership (both spouses are in the military) and identifies short-term and long-term childcare in the event of a deployment (Garrigan 2006). Pre-deployment readiness also includes updating wills, powers of attorney, life insurance, along with other important documents and then safeguarding/maintaining those documents as needed. It became apparent from the interviews for this study that some spouses would not even know where to find a checkbook much less locate important documents.

As stated earlier, this is not sufficient evidence for any broad conclusions about putting employees with military experience on a disaster recovery team. To the contrary, doing so could have unintended consequences if those individuals are called to duty (e.g., the Louisiana and

Mississippi National Guard were mobilized after Hurricane Katrina (Chertoff 2006)). These insights may be useful to consider when preparing a disaster management team. Organizations might want to make sure that individuals with certain medical or health problems carefully consider whether those conditions would cause issues for them during a crisis. Additionally, each employee should also carefully consider their family situation and how that might affect their ability to fulfill disaster recovery obligations, as well as preparing to meet family needs in the event of a disaster.

6.3 Relationships between Qualitative Themes and the Unfolding Model of Turnover

As stated earlier, Lee and Mitchell's (1994) Unfolding Model of Turnover served as a theoretical guide for this study. Several relationships between the qualitative themes and the unfolding model emerged during the analysis and will be discussed. Themes 1, 2, 2a, 6, and 6a relate directly to Lee and Mitchell's (1994, p. 60) concept of a shock as an "event that jars employees toward deliberate judgments about their jobs" albeit as dissimilar influences. Furthermore, these themes are related to the employee's perceived magnitude of the shock. Themes 1, 6, and 6a embody positive actions taken by employers that serve to offset or reduce the effects of a shock when interpreted and incorporated into the employee's system of beliefs and images. Accordingly, before the 'shock' is fully deciphered by the employee, the employer can take actions that may cause the shock to be perceived as less of a jarring event. Conversely, themes 2 and 2a represent employer actions that amplify the jarring event thus magnifying the employee's perceived shock. Lastly, theme 4 relates to the job satisfaction aspect of the unfolding model. This theme identified organizational camaraderie as a precursor to low

turnover as was postulated by Reed (1999) that camaraderie directly enhances job satisfaction, organizational commitment, and employee performance.

These findings provide a deeper understanding of the notion of shocks and after-shocks and how those concepts relate specifically to employer-induced image violations. Lee and Mitchell (1994) proposed that image violations originate with the shock. This study found support that an employee's perception of a shock may be influenced by their employer's reactions to the shock (i.e., the aftershock) which can create image violations. As such, turnover paths are not necessarily automatic; this study provides evidence that employers can take actions to influence perceptions in ways that influence the decision, and although rare, employers can even take actions to reverse the decision to leave the firm.

CHAPTER 7: CONCLUSION

This chapter discusses the limitations and contributions of the study along with recommendations for future research directions. First, a discussion is presented about the limitations of the study. Then, the theoretical and practical contributions are presented, followed by a discussion for future research directions. Finally, conclusions are drawn concerning the overall research project.

7.1 Generalizability of the Findings

Natural disasters do not discriminate between employees' job titles or professions; everyone in the organization will be affected. What makes IT professionals unique during a crisis is their skills and knowledge to manage, safeguard, and recover valuable data and related systems that facilitate the organization's processes. However, if an IT professional is enduring the hardship of a disaster to recover the client list for a bank, he (or she) could very likely be accompanied by a representative of the loan department in that effort. In all areas of an organization, there will be employees who are likely to be dealing with many of the same issues as the IT professionals in this study encountered. And, similarly, retention of those non-IT employees will be important to the organization. While we cannot assume generalizability of the findings to other professions in an organization, no evidence surfaced during the analysis to indicate that the findings would not be generalizable.

Natural disasters come in a variety of shapes and sizes (e.g., hurricanes, earthquakes, tsunamis). Each type of natural disaster also exhibits a unique set of hazards (high winds,

flooding, fire, etc.). The magnitude of the destruction and the extent of the effort and time it takes to recover can vary. As stated earlier, Hurricane Katrina was the most destructive natural disaster in the history of our country (Knabb et al. 2006). Image violations might be less likely to occur and less likely to have a major emotional impact on employees than something as severe as Hurricane Katrina.

7.2 Limitations

Like every research endeavor, this study is limited in certain aspects. These limitations must be taken into account while interpreting the research results. In this section, the limitations surrounding the study are discussed.

7.2.1 Recall Bias

In this case, the lag between the shock and the study was over two years. This time lag may introduce the potential for recall bias that arises with a retrospective design. Though this potential exists, research suggests that such retrospective designs are not necessarily biased and remain a viable research strategy (Miller et al. 1997). Regardless, the same retrospective biases were equally possible in the other model tests (Lee et al. 1996; Lee et al. 1999; Niederman et al. 2007) and, thus, the classification accuracy is comparable.

Respondents were asked to report their work and personal experiences surrounding Hurricane Katrina. Three quarters of the survey participants and all of the interviewees identified Hurricane Katrina as a jarring event in their lives. Wheeler, Stuss, and Tulving (1997) found that events held in episodic memory mental structures are accurately remembered and

Symons and Johnson (1997) found that self-based referencing structures grow increasingly accurate over time as evidenced by the vivid and powerful stories communicated in this paper.

7.2.2 Sampling Bias

As discussed earlier, a snowball sampling methodology was utilized. This sampling methodology was purposefully selected to target IT professionals living in affected regions and cannot be considered a random sample. Snowball sampling introduces the possibility of a biased sample. In the context of this study, the sample was susceptible to biases of location, employer, and professional affiliations along with social and professional networks.

An obvious sampling bias is that of location with over half of the respondents living and working in Louisiana. With the three largest population centers most affected by Hurricane Katrina being New Orleans (metro population: 1.3 million), Baton Rouge (metro population: 780K) and the Gulfport-Biloxi metro area (population: 231K) (Frey et al. 2007), a sample of IT professionals from the Gulf Coast affected by Hurricane Katrina might expect more responses from Louisiana but his study makes no claims of a non-biased or representative sample. Although there were no indications, the sample was susceptible to biases of organizational and professional affiliation. Additionally, the sample was susceptible to being biased by the individual participants forwarding the survey URL. Once again, there were no indications of any individual, or individuals, biasing the sample but this technique has a tendency to follow social networks (Salganik and Heckathorn 2004). The potential for bias does not preclude the use of quantitative analysis on a snowball sample. Early studies such as Etter and Perneger (2000) found that bias in descriptive statistics does not necessarily imply bias in analytical statistics.

7.3 Theoretical and Practical Contributions

This section will discuss the contributions of this study and the resultant findings. First, the theoretical contributions will be presented and discussed. Then, the practical contributions will be presented and discussed.

7.3.1 Contributions – Theoretical

Most importantly, this study provides strong evidence of the unfolding model's utility for examining the turnover of IT professionals experiencing a natural disaster. Evidence suggests there are common decision paths leading to the turnover decision. Evidence also suggests there is an additional emergent path for explaining post-disaster turnover. Statistically, the findings from this study are significantly different from both the findings of Lee et al. (1996; 1999) and Niederman et al. (2007). Although statistically different, the findings from this study follow the classification trends identified by Lee and Mitchell (1994) and verified by additional studies (Lee et al. 1996, 1991; Morrell et al. 2004; Holtom et al. 2005). Evidence from this study suggests IT professionals follow common decision paths leading to turnover as identified by Lee and Mitchell (1994). More specifically, this study identified path 3 as the most frequently utilized turnover decision path which was a common discovery in previous studies (Lee et al. 1996, 1991; Morrell et al. 2004; Holtom et al. 2005). As expected, this study provides little support for Niederman et al.'s (2007) suggestion that IT professionals likely take atypical routes in deciding to leave current employment.

This study further suggests that measurement improvement of the image violation construct may be needed. Participant's perceptions of an image violation based on an

employer's actions described in the interviews are very similar to the description of a psychological contract. The unfolding model may benefit from either an integration of the psychological contract theory or a more narrow and distinctive definition.

The existence of an emergent turnover path in this study makes two potential contributions to the model. The only difference between turnover path 3 and path 3b is the existence of an image violation. Because of the similarity and since path 3b identifies low job satisfaction, the measures for an image violation might be adequate to detect subtle image violations. As an alternative, Lee et al.'s (1999) measures of an image violation could be sufficient and this study identified an emergent turnover path unique to disaster recovery.

7.3.2 Contributions – Managerial

A disaster recovery plan describes how an organization will deal with potential disasters (Housel et al. 1986). Just as a disaster is an event that makes the continuation of normal functions impossible, a disaster recovery plan consists of the precautions taken so that the effects of a disaster will be minimized and the organization will be able to either maintain or quickly resume mission-critical functions. Typically, disaster recovery planning involves an analysis of business processes and continuity needs; it may also include a significant focus on disaster prevention (Junglas and Ives 2007).

The practical contributions of this study include providing insights into how a natural disaster could prompt an employee into eventually leaving their organization, and why they have left other organizations in the past. This information can address organizational issues raised by employees experiencing a disaster and thereby potentially increase the probability of their

staying. This information can be used in developing and implementing a disaster recovery plan that reduces the likelihood of focusing on people with a high probability of leaving the organization when a disaster strikes. In short, organizations concerned about post-disaster turnover should understand the factors most likely to prompt their employees to consider leaving such as family concerns. Organizations may need to provide 'non-traditional' assistance to employees. Some of the assistance revealed in this study includes:

1. Time off
   Immediately after a disaster, employees will have a myriad of things to do (check on extended family, deal with damaged property, etc.). Allowing the employees to have time off will give them the opportunity to contend with their non-work roles (parent, spouse, property owner, etc.) in a manner that makes sense to them.

2. Providing childcare
   Many services, such as childcare, may not be available for weeks (or months) after a disaster. Employees with children can be distracted, less productive, or even absent from work when their normal channels of childcare are not available or disrupted.

3. Providing gas
   Due to a damaged infrastructure, certain supplies like may not be available, or in short supply, after a disaster. Without fuel for their vehicles, critical employees may find it difficult or impossible to commute from home to work. Organizations that provide fuel, or coordinate a supply of fuel, will ensure their employees can travel to work.

4. Providing housing
   Without some type of temporary housing, employees with damaged or destroyed homes may be forced to evacuate outside of the disaster area and thus, might not be able to continue working for the organization. Providing a temporary housing solution gives employees additional options and will increase the likelihood of retaining critical IT professionals.

5. Additional compensation
   Bonuses and other forms of compensation are an excellent way of communicating gratitude to employees. The extra compensation not only provides extra incentive for employees to stay with the organization but it also speeds their recuperation and the organization's productivity.

Many of the respondents described their company's disaster management plan as ad hoc or nonexistent before Hurricane Katrina. Some employees stated that while their employer may have become serious about disaster planning and recovery immediately after Hurricane Katrina the plans have not been kept current. Some of the lessons learned that organizations should incorporate into their disaster management plans include:

1. Keep the plan current
   Organizations should schedule periodic reviews to ensure the correct staffing and address changes with systems and business processes. One participant stated that his organization did this at the start of every hurricane system. An annual review should be the minimum effort an organization puts forth. Multiple yearly 'exercises' would serve the organization much better and would also verify the practicality of the plan.

2. Seek committed employees
   Some employees would be more effective members of a disaster recovery team than others. Foremost, the employees should possess the required skill set needed. Organizations should seek employees that are committed to the organization and the plan. Commitment could be built from the teamwork and camaraderie established in the periodic 'exercise'. Additionally, the disaster team members should receive some type of extra incentive (financial, etc.) that would create an extra sense of obligatory commitment.

3. Seek 'buy-in' from the family
   With work-family conflict being a major factor in the disaster related turnover decision, gaining a 'buy-in' from the employee's family could help alleviate the role conflict and stress before it starts. Families should be included in the disaster planning. Many participants expressed a desire to bring their families if they evacuate to an off-site recovery location. Likewise, some of the members of an on-site ride-out team also stated that having their families with them would have enabled them to concentrate on the job rather than worry about the safety of their family.

7.4 Future Research Directions

This research constitutes an initial step toward understanding the factors that influence the turnover of IT professionals who have been affected by a natural disaster. Additional studies

are required to gain a more comprehensive understanding of this particular turnover phenomenon, and confirm the emergence of a new path in the Unfolding Model of Turnover (Lee and Mitchell 1994) and corroborate the observations concerning the potential generalizability of this study's findings.

In this study, the turnover phenomenon of interest was restricted to turnover of IT professionals affected by Hurricane Katrina. In order to examine the generalizability of the results, the study should be replicated in different contexts using complementary samples to identify consistent turnover factors between natural disasters. For example, future work might focus on the experiences of IT professionals experiencing a natural disaster in areas outside of the Gulf Coast. Since the Gulf Coast is prone to storms, a potential study could focus on another recent hurricane, such as Hurricane Rita, or another storm in the future. Later, different types of natural disasters could be examined. Synthesizing the findings of these studies, other future could focus on man-made disaster, such as acts of terrorism. The findings could be used to create a knowledge repository for best practices.

An important avenue for future work involves the integration of other complimentary turnover theories, like psychological contracts (Rousseau 1989), into the Unfolding Model of Turnover (Lee and Mitchell 1994). Inclusion of the psychological contract theory may help capture and explain some of the subtleness of an image violation and lead to a better understanding of the turnover process.

Another possibility would be to conduct a case study and focus on an organization affected by a single technology crisis, such as ERP implementation, or other stressful situation

involving the IT artifact. Although the effects of an organization's internal crisis might not be as far reaching as a large disaster, it is also an important area of research for future efforts.

Lee and Mitchell (1994, p. 60) defined a shock as "positive, negative, or neutral; expected or unexpected; and internal or external to the person that experiences it." Future research could also focus on identifying and comparing the employee's perception of the shock using contrasting combinations of the perceived shock.

7.5 Conclusion

This study investigated the factors that influence turnover of IT professionals affected by a natural disaster. Synthesizing the pertinent literature on the Unfolding Model of Turnover (1994) and other well established theories on voluntary turnover such as psychological contracts and work-family conflict, disaster specific research questions were developed and a mixed methods research design was applied to investigate those questions. Utilizing a concurrent nested research strategy, two interrelated studies were conducted. The quantitative portion consisted of a web-based survey to collect data from IT professionals in Louisiana, Mississippi, Texas, and Alabama. The qualitative portion was the dominant portion that guided the study and involved semi-structured interviews with selected participants. Data from the quantitative and qualitative were mixed during collection and analyzed at the end of each of the three data collection phases.

Findings from the study indicate that the Unfolding Model of Turnover (1994) is a useful and appropriate research tool for studying turnover of IT professionals experiencing a natural disaster. The study also had a number of theoretical and practical implications. This study

contributes to the state of knowledge in the turnover and crisis management domains. Specifically, it adds to the literature on the turnover of IT professionals and natural disaster recovery. The findings of this study are important and relevant to organizations susceptible to natural disasters. As the factors that influence disaster related turnover are identified, strategies can be developed to mitigate the turnover of critical IT employees. The study also serves to validate the Unfolding Model of Turnover (Lee and Mitchell 1994) for employees experiencing a common 'shock' such as a natural disaster.

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APPENDIX A: SURVEY

Post-Katrina Job Satisfaction of IT Professionals

We are a team of researchers at Louisiana State University who are trying to learn more about the influence Hurricane Katrina had on the retention and organizational commitment of information technology (IT) professionals in the Gulf States. A better understanding surrounding the shock caused by natural disasters is important because IT professionals are critical to the recovery and ongoing operations of their organizations. High turnover rates and loss of these valuable employees and their associated skills/knowledge are major concerns for the organization.

For the purposes of this study an 'IT professional' is any person whose primary job responsibilities involve the management, development, or support of IT applications or IT infrastructure (e.g., networks). A few examples are: web application developer, network administrator, computer operator, help desk operator, systems analyst, and CIO.

As a first step in our study, we are conducting this survey of IT professionals in Louisiana, Mississippi, Alabama, and Texas that were affected by Hurricane Katrina. A strong IT workforce is critical to the recovery of the Gulf region.

The survey is completely anonymous and voluntary, and will take about 10 minutes to complete.

If you have any questions about this study or the survey, please contact us using the email addresses given below. We look forward to sharing the study findings with you, and will post the summary results on the AITP Web Portal.

Thanks for your time and participation!

Dr. Suzanne Pawlowski
Associate Professor
Information Systems and Decision Sciences Department
email: spawlowski@lsu.edu

James Davis
PhD Student
Information Systems and Decision Sciences Department
email: jdavi48@lsu.edu

E.J. Ourso College of Business Administration
Louisiana State University

INFORMED CONSENT

(LSU Institutional Review Board (IRB) Contact: Dr. Robert C. Mathews, Chairman, at 203 B-1 David Boyd Hall, Phone (225) 578-8692.)

This survey questionnaire is intended to provide information about the influence Hurricane Katrina had on the retention of ITprofessionals in companies and the IT profession. Responses to this questionnaire are anonymous. No identifying information will be associated with your individual responses, and your individual responses will not be shared with anyone other than the researchers. Furthermore, all data collected from this questionnaire will be presented in summary form only. Your participation in this study is purely voluntary, and you may stop at any time.

Please select 'Next Page' below to indicate your consent to voluntarily participate in this study. (If you choose not to participate, simply close your browser.)

1) Hurricane Katrina was a jarring event in my life.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neutral
- ❍ Disagree
- ❍ Strongly Disagree

2) Briefly describe your experience from Hurricane Katrina.

_____
_____
_____

3) The events surrounding Hurricane Katrina started me thinking about quitting my job.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neutral
- ❍ Disagree
- ❍ Strongly Disagree

4) Since Hurricane Katrina, have you quit your job or switched employers?

- ❍ Yes
- ❍ No

5) I have encountered a similar set of circumstances before (in terms of a severe natural disaster).

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neutral
- ❍ Disagree
- ❍ Strongly Disagree

6) If so, briefly describe what happened.

_____
_____
_____

7) I have left a job before for essentially the same or similar circumstances.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neutral
- ❍ Disagree
- ❍ Strongly Disagree

8) Since Hurricane Katrina, how compatible are your *personal values/ethics* with those of your pre-Katrina firm?

- ❍ Very Compatible
- ❍ Somewhat Compatible
- ❍ Neither Compatible Nor Incompatible
- ❍ Somewhat Incompatible
- ❍ Very Incompatible

9) Since Hurricane Katrina, how compatible are your *professional values/ethics* with those of your pre-Katrina firm?

- ❍ Very Compatible
- ❍ Somewhat Compatible
- ❍ Neither Compatible Nor Incompatible
- ❍ Somewhat Incompatible
- ❍ Very Incompatible

10) Since Hurricane Katrina, how compatible are your *personal goals* with those of your pre-Katrina firm?

- ❍ Very Compatible
- ❍ Somewhat Compatible
- ❍ Neither Compatible Nor Incompatible
- ❍ Somewhat Incompatible
- ❍ Very Incompatible

11) Since Hurricane Katrina, how compatible are your *professional goals* with those of your pre-Katrina firm?

- ❍ Very Compatible
- ❍ Somewhat Compatible
- ❍ Neither Compatible Nor Incompatible
- ❍ Somewhat Incompatible
- ❍ Very Incompatible

12) Staying with my pre-Katrina firm, I would be able to achieve most of my career goals.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neutral
- ❍ Disagree
- ❍ Strongly Disagree

13) Staying with my pre-Katrina firm, I would be able to achieve most of my personal goals.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neutral
- ❍ Disagree
- ❍ Strongly Disagree

14) Since Hurricane Katrina, my career has progressed as I expected.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neutral
- ❍ Disagree
- ❍ Strongly Disagree

15) Since Hurricane Katrina, my personal goals are progressing as I expected.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neutral
- ❍ Disagree
- ❍ Strongly Disagree

16) <u>BEFORE</u> Hurricane Katrina, how satisfied were you with:

	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
your coworkers	❍	❍	❍	❍	❍
nature of the work	❍	❍	❍	❍	❍
fringe benefits	❍	❍	❍	❍	❍
the firm as an employer	❍	❍	❍	❍	❍
recreational activities	❍	❍	❍	❍	❍
the supervision you received	❍	❍	❍	❍	❍
career progression	❍	❍	❍	❍	❍
personal goals	❍	❍	❍	❍	❍
career opportunities	❍	❍	❍	❍	❍
financial rewards	❍	❍	❍	❍	❍

17) <u>AFTER</u> Hurricane Katrina, how satisfied were you with:

	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
your coworkers	❍	❍	❍	❍	❍
nature of the work	❍	❍	❍	❍	❍
fringe benefits	❍	❍	❍	❍	❍
the firm as an employer	❍	❍	❍	❍	❍
recreational activities	❍	❍	❍	❍	❍
the supervision you received	❍	❍	❍	❍	❍
career progression	❍	❍	❍	❍	❍
personal goals	❍	❍	❍	❍	❍
career opportunities	❍	❍	❍	❍	❍
financial rewards	❍	❍	❍	❍	❍

18) Since Hurricane Katrina, describe your search for another job.

- ❍ Very Comprehensive Search
- ❍ Comprehensive Search
- ❍ Occasional Search
- ❍ Looked at Least Once
- ❍ No Search

19) Have you received any job offers since Hurricane Katrina?

- ❍ Yes
- ❍ No

20) Is getting another job offer likely?

- ❍ Yes
- ❍ No
- ❍ Not Sure

21) Since Katrina, did you evaluate any specific job alternatives?

- ❍ Yes
- ❍ No
- ❍ Not Sure

22) How difficult would it be to find another job?

- ❍ Very easy
- ❍ Easy
- ❍ Neither easy nor hard
- ❍ Hard
- ❍ Very Hard

23) Did you seriously consider nonwork options (staying at home, graduate school, etc.)?

- ❍ Yes
- ❍ No
- ❍ Not Sure

24) If you responded yes, please indicate the type of nonwork option.

_____

25) If there were any actions by your pre-Katrina employer that significantly affected your commitment to that organization, please describe.

_____
_____
_____

26) What is your gender?

- ❍ Male
- ❍ Female

27) What is your age range?

- ❍ Under 18
- ❍ 18 - 24
- ❍ 25 - 34
- ❍ 35 - 44
- ❍ 45 - 54
- ❍ 55 - 64
- ❍ 65 or older

28) What was your pre-Katrina job function?

- ❍ Upper Management
- ❍ Middle Management
- ❍ Junior Management
- ❍ Administrative Staff
- ❍ Support Staff
- ❍ Student
- ❍ Trained Professional
- ❍ Consultant
- ❍ Temporary Employee
- ❍ Researcher
- ❍ Self-employed/Partner
- ❍ Other

29) What was your pre-Katrina job title?

_____

30) What city did you work in before Hurricane Katrina?

_____

31) What city did you work in immediately following Hurricane Katrina?

_____

32) What city are you working in currently?

_____

Thanks for taking the survey!

While responses to this questionnaire will be treated confidentially, we would welcome the opportunity to ask followup questions. If you are willing to speak with one of the researchers, please provide us with a phone number and/or email address.

33) Name

_____

34) Phone number

_____

35) Email address

_____

APPENDIX B: INTERVIEW GUIDE

The questions and topics of discussion during the interviews were unique and tailored to each individual interviewee. Here is a list of representative questions. Follow-up questions were asked as necessary.

1. Please describe your experiences surrounding Hurricane Katrina from a work and personal perspective.

2. What disaster related actions did your employer take immediately after Hurricane Katrina?

3. Have you switched employers since the Hurricane?

4. What support did your employer provide after Hurricane Katrina? Childcare? Housing? Fuel? Financial assistance?

5. Was there any type of priority for who got the support?

6. How did your employer's reaction to Hurricane Katrina influence your decision to stay or leave?

7. Did your employer do anything that violated your image or values of what a good employer should do?

8. Please describe the turnover at your organization since Hurricane Katrina.

9. Please describe your company's disaster management plan. Were you part of the plan?

10. How has your company's disaster management plan changed since Hurricane Katrina?

11. Is there anything else you would like to add?

APPENDIX C: CODES

Family
Brought Family to Work
Childcare
Disaster Recovery Plan - Take Family
Family in Disaster Area
Family over Job
Seperated from Family
Supporting Family and Friends
Supportive Spouse

Turnover
Turnover - High
Turnover - Low
Turnover - Transferring within The Organization
Turnover anomaly: High in Org. and Low in Dept.
Turnover from a Lack of Housing

Disaster Recovery Plan
Disaster Recovery Plan
Disaster Recovery Plan - Improvements since Katrina
Rideout Crew
Risk Managment

Employer Actions - Bad
Employer Apathy
Image Violation
Impersonal Response from Organization
Lack of Recognition
Layoff Employees
Missed Opportunity
No Disaster Recovery Plan
No Repercussion on Tardy Employees
Not Following Plan
Uncoordinated Employer Response
Unrealistic Disaster Recover Plan
Phony Press Release

Employer Actions - Good
Allowed to Telecomute
Alternative Work Hours
Compensation
Convey Longevity
Employer Compassion
Gave Time Off
Getting Employees Back to Work
Opened Alternate Loccation for Employees
Organized Response by Employer
Payroll - Getting Employees Paid
Provided Car and Gas
Provided Food
Provided Housing
Provided Immunizations
Providing Gas
Valuing Employees
Commitment to Clients
Communication Plan
Worked in Alternate City
Compromise between Recovery and Employee's Needs

Information Technology
Catastrophe - Catalyst for IT Investment
Failed backups - Tape
Fragmented IT Systems
IT - Cost Avoidance
IT - Decision Support
IT - Enabler
IT - Mitigate Risk
IT Actions Taken After the Storm
IT Projects Put on Hold
IT Providing Business Solutions
Off-Site Data

Military Experience
Military Experience
Military Experience - Discipline
Military Experience - Family Care
Military Experience - Mantaining Documents
Military Experience - Risk Management
Physical Fitness

Job Specific
Job Autonomy
Job Opportunities
Job Role Changed
Job Satisfaction
Job Security
Job Stability
Autonomy
Burnout

Employee Specific
Camaraderie
Employee Commitment
Employee Not Coming Back to Work
Helped Shelter Evacuees
Left Job After Storm
Perseverance
Proactive Behavior
Put Work over Self
Refused to go Off-Site
Remained Flexible
Remorse for Leaving
Returned to Original Profession - Nurse
Returned to Pre-Katrina Employer
Sense of Obligation
Single with No Obligations
Slept at Work
Thoughts of Quitting - No
Thoughts of Quitting - Yes
Took a Lower Paying Job
Want to Help after Hurricane
Wanted to Leave the Denver Housing Market
Close to Retirement
Come out of Retirement
Difficulty Focusing on Work
Role Conflict

Katrina Specific
Blocked from Disaster Area
Difficulty Traveling
Evacuation
Increased Work Load
Loss of Income
Opportunity after the Hurricane
Proximity to Disaster
Personal Damage from the Hurricane
Vulnerability - Loss of Mail
Shock

Business Specific
Accurate Information
Business Deficiencies
Infrastructure Issue
Total Loss of Data

Unassigned
Alternative Search
Career Promotion - Same Company
Donating to Charity - Too Much Donations
Evacuation - Decision
Firing Partner
Importance of Time
Insurance
Job Offer
Minimal Impact on Work
No Complaints about Employer
No Immediate Need for Data
Other Reasons for Leaving
Pre-existing Script
Priority of Resource
Reasons Others Left
Recalled from Evacuation
Reciprocity - Employee & Employer
Similar Disasters
Societal Breakdown
Stress
Terminating Employee
Trust

APPENDIX D: SOLICITATION EMAIL

James Davis

From: James Davis [jdavi48@lsu.edu]
Sent: Monday, June 16, 2008 10:13 PM
To: jdavi48@lsu.edu
Subject: Effects of Hurricane Katrina on IT Professionals - Follow-up

You recently responded to my survey about IT Professionals and your experiences with Hurricane Katrina. I am interested in speaking to some of the participants to gain a deeper understanding about their experiences. Would you be available to speak to me via a phone interview?

Our conversation will most likely take 10 - 20 minutes..although, I would be willing to listen much longer!

Respectfully,
James Davis
PhD Student
Louisiana State University
http://www.bus.lsu.edu/academics/ISDS/PhDWebPage.asp?autoid=473

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APPENDIX E: REQUEST TO FORWARD SURVEY URL

James Davis

From: James Davis [jdavis@peoplenetz.com]
Sent: Tuesday, April 15, 2008 5:12 PM
To: 'jdavi48@lsu.edu'
Subject: Survey Participation

Thanks for taking some time out of your busy schedule to complete my survey on IT Professionals and Hurricane Katrina. You have the gratitude of an interested researcher.

I currently have slightly over 100 usable surveys and hope to collect 50 – 100 more in the next few weeks. Please feel free to forward the survey link to any other IT Professionals you think may be interested in participating.
http://surveys.bus.lsu.edu/efm/wsb.dll/s/79g282

Regards,
James Davis
PhD Student
Louisiana State University
http://www.bus.lsu.edu/academics/ISDS/PhDWebPage.asp?autoid=473

1

VITA

James Brian Davis was born in Oneonta, Alabama, to Perry and Linda Davis. He graduated from J. B. Pennington High School in 1989 and received a Bachelor of Science degree, majoring in mathematics, in 1994, from the University of Alabama. As an undergraduate student, James was a ROTC cadet at UA and received a commission as a 2nd Lieutenant in the U. S. Army. He held various command and staff positions finally leaving the active army as a Captain in 1998 and transferring to the army reserve. James moved to Mobile, Alabama, and worked as a software developer while pursuing a graduate degree at the University of South Alabama, where he completed a Master of Science in computer science in 2002.

James started the Information Systems and Decision Science (ISDS) doctoral program at Louisiana State University (LSU) in the fall of 2002. After completing his first semester at LSU, James was mobilized and served overseas in Operation Iraqi Freedom. Upon completion of his tour, James returned to LSU in the spring of 2004 to continue his doctoral degree.

James has accepted a position as an adjunct professor at Texas State University – San Marcos where he will begin teaching in the spring of 2008. Working with some of his doctoral student colleagues, James was a founding partner of the software company Peoplenetz and will remained involved with company operations and software development at the corporate headquarters in Austin, Texas. Additionally, James has continued his military career in the army reserve where he holds the rank of Major and maintains adjunct faculty positions at the Command and General Staff College at Fort Leavenworth, Kansas and the Armor School at Fort Knox, Kentucky. James is married to Sarah Frances Davis, M.D., and has two daughters, Sarah Jane and Helen. They plan on raising their family in the Austin area.